HELSINKI SCHOOL OF ECONOMICS (HSE)
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AN ANALYSIS OF FACTORS AFFECTING COMPETITIVENESS

Energy technology industry

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ABSTRACT

There is a strong pressure for change in the energy technology industry, especially in mechanical contracting. It is seen as a movement of cheaper labour force from Eastern European and new EU countries towards Central and Northern Europe and as changes in legislation. Both of these factors increase competition rather intensely. The phenomenon resembles the China Phenomenon and causes a lot of pressure on all actors working in the field. Therefore, there is strong pressure on companies to reassess their competitive advantages, business plans and strategies.

The Finnish labour costs cause difficulties in successful competition for Finnish companies. Hence, no matter how important the price level and costs structure in biddings are, Finnish companies should differentiate to be able to keep up with international competition. Soon cheaper labour force will arrive to Finnish markets and then the competitive advantages have to be clear in the home market as well.

The aim of this study is to determine and clarify the prerequisites and components of the ability to compete in mechanical contracting in energy technology industry. In the results it is presented that successful contractor in mechanical contracting will, however, have to be at least in considerable price level in order to be able to compete in the biddings in which decisions are mainly based on prices. After that a company needs to stand out in comparison to the competitors, which can, for example, be done via system selling: offering a complete chain of services. This can be difficult sometimes, though, because today the trend among investors is to buy fractured pieces of projects. It can be seen, however, that in the near future the trend moves to the direction of buying complete service chains.

This study contains an empirical research based on one single-case company method. Prior to the empirical part a theoretical framework was established based on literature on competitiveness, business models and marketing as well as industry specific information. Empirical data was mainly collected via personnel interviews.

There is not much research concerning this specific industry and though this study cannot be generalised to all the operators in the field, the aim of the study is to illuminate the competitiveness of industrial service companies and to guide the development and the competitiveness of a case company.

Key words: competitive advantage, core competence, differentiation

TIIVISTELMÄ

Energiateknologiateollisuuteen, ja erityisesti mekaaniseen urakointiin, kohdistuu tänä päivänä suuria muutospaineita. Paine näkyy erityisesti halvan työvoiman liikkumisena itäisestä Euroopasta ja uusista EU- maista kohti Keski- ja Pohjois-Eurooppaa sekä hallitusten esittäminä lakimuutoksina. Molemmat lisäävät kilpailua alalla. Ilmiö muistuttaa Kiinailmiötä ja aiheuttaa paljon painetta kaikille alalla toimijoille. Tämä pakottaa yritykset uudelleen arvioimaan kilpailua kykyään ja sen osatekijöitä sekä strategioita.

Kotimaisen työvoiman kustannukset tuovat lisähaasteita suomalaisille yrityksille. Sen vuoksi suomalaisten yritysten tulisikin, hintatason ja kustannusten vuoksi erottautua kilpailijoista differoimalla tuotteitaan ja palveluitaan. Viimeistään halvan työvoiman saapuessa Suomeenkin tulee kilpailutekijöiden olla selviä myös kotimarkkinoilla.

Tutkielman tavoitteena on selvittää kilpailukyvyn edellytyksiä ja osatekijöitä mekaanisessa urakoinnissa energiateknologiateollisuudessa. Tutkielman tuloksissa selviää, että menestyvän urakoitsijan täytyy mekaanisessa urakoinnissa olla kuitenkin hintatasoltaan edes kohtuullinen, jotta voisi menestyä tiukoissa tarjouskilpailuissa. Tämän jälkeen tulee erottautua kilpailijoista esimerkiksi tarjoamalla kokonaisvaltaista palveluketjua asiakkaalle. Tämä voi joskus tosin olla haasteellista, sillä ainakin tällä hetkellä markkinoilla on tendenssi pilkkoa projekteja siten, että investoijat ostavat vain pieniä paloja ja kokoavat itse osista kokonaisuuden.

Tämä tutkielma sisältää empiirisen tutkimuksen, joka perustuu yhteen case - yritykseen. Ennen empiiristä osiota tutkielmassa on esitetty teoreettinen viitekehys, joka perustuu kilpailuteorioita, liiketoimintamalleja, markkinointia ja energiateollisuutta koskevaan kirjallisuuteen. Empiirinen tieto kerättiin pääosin haastattelemalla yrityksen henkilökuntaa.

Tätä teollisuuden alaa käsittelevää kirjallisuutta ei juurikaan löydy ja vaikka tätä tutkielmaa ei voidakaan täysin yleistää kaikkiin alalla toimijoihin, niin tutkielman tarkoituksena on kuitenkin valottaa teollisen palvelualan kilpailukyvyn tekijöitä sekä ohjata case –yrityksen kilpailukyvyn kehittämistä.

Avainsanat: Kilpailuetu, ydinosaaminen, differointi

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1. INTRODUCTION

1.1. Background

The area of interest in this study is the key factors of competitiveness in today's mechanical project contracting in energy technology industry. The study is related merely to the European and European Union countries, including Finland and Scandinavia, which are considered as home markets. Mechanical contracting stands for the mechanical part of a plant, for example piping and fittings as well as equipment installation and steel structures. There are also civil works and electricity & instrumentation included in plants, in addition to mechanical contracting.

The reasons that have lead to this study are the great changes in mechanical contracting in energy industry. These changes are related, for instance, to the movement of labour force, decrease in the price level in mechanical contracting and the changes in legislation to improve competition. Marketing in business-to-business sector is usually very challenging and now because of the structural changes in the industry are forcing companies to reconsider there approaches on customers, they are also forced to consider there promotional capabilities and strategies.

The movement of labour force during the last five years from Eastern European countries to Central Europe has been forwarded by the enlargement of the European Union and the right of free movement of labour force. Subcontractors from the new EU countries, for example Poland, the Czech Republic and Romania, have in recent years entered Central European and especially German construction sites. Now this phenomenon is spreading further and approaching

Scandinavia and Finland.

This phenomenon, which also resembles the China Phenomenon, has affected greatly the price level in mechanical contracting. The traditional and conventional contracting using the own erection resources of the company is facing tightening competition. The competitors are using more and more subcontractors from the new EU countries or even cheaper Eastern European labour force.

At the same time many governments have updated their legislation to improve the possibilities for competition in a way that it may more easily enable the companies to import and use foreign labour. All these factors raise the question of the permanency of these changes and increase the concern of safety and quality of mills and plants built. Also industry standards concerning materials are changing. Overall, the whole industry is changing massively in the forthcoming years.

1.2. Justification

This research is worth conducting because of the changes in the labour structure due to EU enlargement and because of the change in the competitive situation it causes. These issues have aroused several questions about the future and the nature of industry, and they affect the whole range of business functions from operational decisions to marketing. All energy related topics are very important today, which affects the related industries significantly as well.

The author's personal interest to this subject arises from the different characteristics of the field of operation compared to consumer business and several years of work experience in the case company.

This study is very important to the case company and is conducted for it to enable to update their core competencies and through that ensure the increase of their competitiveness. Therefore this study is mainly aimed at the administration of the company. These issues, however, may affect other companies too, both in this business sector, but also other companies operating in business-to-business service fields.

1.3. Case company

This study is carried out in cooperation with a Finnish industrial company, which is a subsidiary of a large Finnish corporation. The company mainly operates as a sub-contractor in energy technology production. The role of the company depends on the project and is defined case by case. The company's main market area is Finland and Scandinavia, but it has considerable and increasing amount of projects abroad, globally. The company offers industrial services in energy technology and process technology industries, in both mechanical contracting and electricity and automation. It offers an extensive service chain from industrial or construction design, material management and project management to subcontracting and fabrication, which full fill high juridical and financial requirements. This study focuses on mechanical contracting, which is of a project nature in energy technology.

1.4. Research problem and objectives

The aim of the study is to define the elements and components of competitiveness of a Finnish company, operating in the energy technology industry, through

multiple competitiveness theories and, finally, determine how these competitive advantages can be fostered, or even created if they do not exist.

The research problem is following:

The lack of clear competitive edges is causing relatively slow sales in international context.

The lack of clear competitive edges is causing slow sales in international context although the domestic position of a company might be strong. The main cause is most likely rather high price level, which decreases success in bidding competitions that are common in this business sector. Lacking competitive edges even lowers the possibilities to become the chosen contractor because the investors cannot see the reasons for the higher pricing and the benefits that the case company could have compared others.

In order to be able to solve the research problem two questions have risen.

What are competitive advantages that a Finnish company should have in order to become strong international player in the field?

How can these advantages be strengthened?

Therefore, this study aims to identify the competitive advantages of a Finnish company in this particular field of business and to determine how these advantages could be increased and strengthened.

1.5. Literature overview

This area and subject of competitiveness has been widely studied during many years and decades. The best-known researchers are Michael Porter (1985) and Jay B. Barney (1991) among many others. Porter and Barney represent the two main schools or perspectives in competitiveness studies: Porter represents Five forces model, Value chain thinking Diamond model, and Barney represents Resource Based View of company's competitiveness, which was originated by Penrose already in 1959. Some theories have been worked out further: Normann and Ramires (1991: Wikström & Normann, 1994) have processed the Porter's Value chain into a Value star that resembles the process of creating value in co-production with different focus groups. Gary Hamel and C.K. Prahalad have also studied competitiveness from the viewpoint of future strategic development and the meaning of core competencies to competitiveness (1990). Reijo Luostarinen has also contributed to this field of study with his Excellence Mix theory (Luostarinen 2004). There is also a wide range of new and updated literature in the form of academic journals.

Competitiveness is a salient topic also in other business literature: in magazines and newspapers. In recent days there have been several articles both in foreign and domestic papers. There are many research streams concerning competitiveness.

Marketing is included to the study because it is an integral part of international business but the business-to-business environment and the industry itself create big challenges to marketing and promotion. Nowadays there is also increasingly established for example new energy related publications that enable better promotion. Therefore, marketing literature is a separate part of the literature

review. Also networking, which is very important in the industry in question, is included in the marketing section.

1.6. Theoretical framework

The area of study in this thesis belongs to business management and strategic development of business activities. It is, though, in strong relation to every aspect of business since competitive edges tend to cross every business function. At some point some other fields, such as economics, psychology or sociology, might contribute to the study, because human resources can be a substantial competitive edge, or the general economic situation of this business sector has perhaps an effect on the competitiveness.

1.7. Definitions

There are some key concepts in the field that require some explanation. These are commonly used in this area of business and can be defined as follows:

Energy industry is a sector, which consists of different building and maintenance projects aiming at energy producing. It includes nuclear power stations, hydroelectric plants, diesel power stations and peat and coal power stations.

Mechanical contracting is used to describe the mechanical part of the plant or station: the pipes and fittings and equipment installation in addition to steel structures.

Civil works stands for the actual building, for example footing and building structures.

Electricity and automation includes all the automatic electronic control systems, which are excluded from this study.

Project business term is in the study used to describe the business fields that are solely short or long term projects instead of solid and continuous business relationships. Some of these projects are *turnkey projects*, which mean that the project is a whole system from the first designs to the end, when the keys are handed, so to speak, to the customer.

Investor is the buyer of the project. There are three types of investors: the first group are the investors who are building a plant for their own use to produce energy. The second type is an investor producing a whole turnkey project for some third party and the third one is a variation from the second project that is divided between two or more contractors.

1.8. Limitations

This study was limited to include only mechanical contracting in energy industry in the case company. Combining the mechanical contracting with electricity and automation services may have affect on the competitiveness, but since this particular part of the company does not offer those services (another part of the parent company does) it was excluded. Also process technology was excluded to keep some limits with the complex system. It is limited to the case company only because of the lack of information in general in this industry: it would be almost

impossible to get information of the companies operating in this field because of competitive composition and linkage to the case company for which this study is conducted.

The geographical framework is Europe and European Union, the area that the use of cheap labour force affects most, and in fact solely.

In this study it is assumed that the growing use of cheap labour force from new EU and Eastern European countries is a consistent and permanent trend because it seems truly unrealistic to expect that the situation would return to it's former state.

1.9. Method and structure of research

This study is carried out using a normative case method. Employees in various departments and positions are interviewed in order to gain as broad a view of the subject as possible. More information about methodology will be provided in the third chapter.

The research consists of three parts and eight chapters: the first part is literature review where the current literature on the subject and business sector is analysed. The second part is the empirical part in which the theoretical framework is applied to the company in question. The third part consists of findings and recommendations for the company.

Figure 1 below represents the framework of the study. The literature part deals with theories of competitiveness and marketing, and the empirical part consists of industry and company characteristics and the research part.

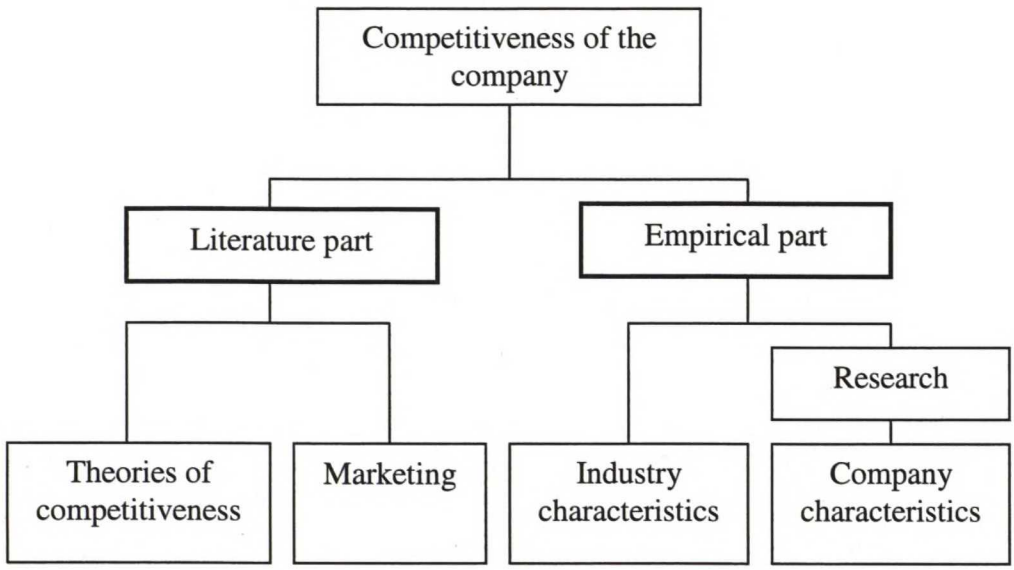

Figure 1. Framework of the study

In the second chapter, after introduction, the literature related to the topic is reviewed with focus on the competitiveness theories. It consists theories by Porter and Barney and some critique towards those theories, as well as some other studies related to competitiveness. Also marketing and promotion literature is included. The marketing includes also networks and, therefore, the network related literature is presented in the marketing section.

The third chapter describes the method of research beginning with choosing the theories, which are used to conduct the empirical part and continuing with the description how the interviews are carried out and who are interviewed.

The fourth chapter first gives some background information about the industry in question and then focuses on presenting the empirical findings of the study.

The discussion and analysis of the empirical data and findings are introduced in the fifth chapter, whereas the sixth chapter presents the conclusion and recommendations and suggestions about the future research possibilities and recommendations.

The seventh chapter includes all references: literature, Internet sources and information of the interview and interviewees. Chapter eight is the appendix that holds all the interview questions.

2. LITERATURE REVIEW

This literature review concentrates mainly on four theories related to competitiveness: Porter's Value chain model and Diamond model, Barney's Resource-based view and Business model thinking. Also Porter's five forces model is reviewed shortly in context with international competitiveness. These theories have been chosen because they were suitable tools to create questionnaire for the empirical part, to analyse data and information, as well as to give tools to enable and provide views to analysis and creation of competitive advantages. Business models help in defining the organisation structure and how it works. This is very important to competitiveness because business model precedes creating a business plan and strategy. At the end there is literature on marketing and networks, which are essential in business-to-business industries also. Especially networking can have a tremendous effect on competitiveness. Porter is, as well, emphasizing marketing and sales in his Value chain model as a primary activity and since business-to-business promotion can be very challenging it is included in the literature view.

2.1. Competitive advantage

Core competence is the one thing that company can do better than the competitors, where as competitive advantage is a relative advantage compared to competitors.

Competitive advantage is an advantage that a company has compared with to competitors. Usually it originates from a mix of core competencies. Competitive

advantages are very important for a firm in modern competition in order to even stay alive. (Luostarinen 2004, 24)

Luostarinen (2004) also presents an excellence mix. It has several areas of excellence, which can then be combined to an excellence mix. Possible areas are product (product development), production (process development), marketing, purchasing, financing, personnel, management and information. There is no single, right kind of mix: every company creates its own. However, the most successful companies have management excellence as the core of the mix. (Ibid, 24)

Prahalad & Hamel (1990) state that core competencies are learning and knowledge in companies, especially the ability to coordinate and integrate production skills and technologies. They suggest three issues that help in identifying core competencies: 1. Core competence provides a potential access to variety of markets. 2. It should make a substantial contribution to perceived customer benefits. 3. It should be difficult to imitate. Core competencies do not diminish or decrease with use, on the contrary – they grow. (Ibid, 82-84)

Therefore, possible core competencies need to be identified and then tested to find out whether they fill the criteria of core competence. This can be done either by following the above-mentioned three steps of Prahalad and Hamel (1990) or by Barney's VRIO framework (1995), which is presented later in the literature part.

2.1.1. Trustworthiness as a source of competitive advantage

Also the effect of trustworthiness on competitiveness has been studied (Barney & Hansen, 1994). Trustworthiness in business-to-business environment is very important because most investments, especially in the energy technology industry, are very expensive, and costs of keeping the plant down, in un-operation, are enormous. Therefore, it is crucially important that the parties of business transaction are reliable and worth of trust: the project has to be completed with great quality in the given timeframe. Trust issues are, hence, good to be considered with suppliers and subcontractors as well as clients.

Barney and Hansen (1994) studied trustworthiness as a source of competitive advantage and the conditions under which trust and trustworthiness in exchange relationships can be a source of competitive advantage for companies. They have identified three types of trust in economic exchanges: weak form trust, semi-strong form trust and strong form trust.

Barney and Hansen have defined trust in a following way (modified from Sable 1993; Barney & Hansen 1994): "trust is the mutual confidence that no party to an exchange will exploit another's vulnerabilities." Barney and Hansen also use Sable's definition of trustworthiness: "an exchange partner is trustworthy when it is worthy of the trust of others. An exchange partner worthy of trust is one that will not exploit other's exchange vulnerabilities." They suggest noticing, that trustworthiness is an attribute of individual exchange partners, while trust is an attribute of a relationship between exchange partners.

There are, as mentioned above, three types of trust, which reflect different reasons

the parties to an exchange can have to have the confidence that their vulnerabilities will not be exploited. Weak form trust means limited opportunities for opportunism; semi-strong form trust stands for trust through governance, and strong form trust means hard-core trustworthiness (Ibid).

The existence of weak form trust does not depend on the erection of contractual or any other form of governance. Trust emerges in this type of exchange because there are limited opportunities for opportunism. This type of trust is likely to occur in only very specific kinds of exchanges, for example in exchanges with limited vulnerabilities. Without these vulnerabilities, opportunistic behaviour is unlikely and weak form trust will exist (Ibid).

Semi-strong form trust exists through various governance devices. If parties to an exchange are protected through these devices, trust can still exist despite significant vulnerabilities (for example due to adverse selection, moral hazard or hold-up). The governance devices impose various kinds of costs to the parties of the exchange behaving opportunistically. If the partners have mutual confidence that their vulnerabilities will not be exploited they will share semi-strong form trustworthiness (Ibid).

Strong form trust is, therefore, hard-core trustworthiness. In this case trustworthiness exists, despite significant exchange vulnerabilities, whether or not elaborate social and economic governance mechanisms exist, because opportunistic behaviour would violate values, principles and standards of behaviour that the partners of exchange have internalised. Due to this, strong-form trust can also be called principled trust. It reflects the values, principles and standards that partners bring to an exchange. Companies as exchange partners can

be strong-form trustworthy for at least two reasons: either a firm possesses a culture and associated control systems that reward strong form trustworthy behaviour, or the specific individuals themselves involved can be strong form trustworthy. (Ibid)

These three forms are not likely to be a source of competitive advantage. As weak form trust is only likely to emerge in highly competitive commodity markets and partners in those markets very rarely expect to gain competitive advantage (Porter 1980; Barney & Hansen 1994), and therefore weak form trust is unlikely a source of competitive advantage: the advantages of weak form trust will occur to all exchange partners equally, therefore giving nobody the competitive advantage. (Ibid)

Semi-strong form trust is economically valuable because its creation assures parties to exchange that their vulnerabilities will not be exploited. The creation of this form of trust depends, however, on some substantial and important governance skills and abilities. The partner must also be able to rely on existing social governance mechanisms and manage the appropriate market-based and contractual governance mechanisms. There must, however, be, in order to semi-strong form trust to be a source of competitive advantage, heterogeneity in the exchange governance skills of competing firms: if most competing companies have similar governance skills they will be equally able to create the conditions under which the trust will emerge. When ever the exchange partners posses rare and costly- to-imitate governance skills and abilities they may be able to use those abilities to gain competitive advantages in creating semi-strong form trust. But when competing exchange partners have similar governance skills the creation of semi-strong trust will generate competitive parity only. (Ibid)

For strong form trustworthiness to be economically valuable all of those involved in exchange must be strong form trustworthy. These economically valuable opportunities: "...reflect either the governance cost advantages that strong form trust exchanges may enjoy over semi-strong form trust exchanges, and/or the ability that strong form trustworthy exchange partners may have to explore exchange options not available to semi-strong form trustworthy partners". Finding and locating the strong form trustworthy exchange partners can be a problematic process. The potential exchange partners should be monitored and observed directly whether or not the potential partner is trustworthy. However, the attributes that create strong form trustworthiness are very difficult to observe directly. Strong form trustworthy partnership can, for example, evolve with time from semi-strong form trustworthiness. (Ibid)

Weak form of trust is only a competitive trust when competitors invest in unnecessary and expensive governance mechanisms. Semi-strong form can be a source of competitive advantage when competitors have differential expensive governance skills and abilities, and when these skills are costly to imitate. Strong form trust is a competitive advantage if all issues of significant stake related in an exchange are strong form trustworthy. Therefore, when two or more strong form trustworthy parties, individuals or firms, engage in an exchange, they can all be assured that any vulnerability that may exist will not be exploited. (Ibid)

2.2. Competitive intelligence

Sometimes competitive advantage or edge can also be found and developed

through examining not only the company itself but its competitors too, and by developing a competitive strategy through that.
Competitive intelligence is an analytical process as well as a product of that process. It is firmly based on the assumption of understanding competitor's strengths and weaknesses lead to more effective strategy formulation and through that competitive superiority. (Bernhardt 1994)

Ian Gordon (1989) has set a few points of the process of creating a competitive edge. First he suggests that the company and its products and services are seen as others see them, for example customers. A careful charting of the minds of the customers will give an idea about the types of competitive information. The starting point of any competitive intelligence is always the customers: what they think. After that it should be figured out why competitors enjoy the position.

Next the company should examine its positioning from the view point of customers' key purchase criteria and relate that to the position of the competitors; at this point it is also essential to examine the entry and exit barriers to the market and barriers to increase the market share as well. (Ibid)

The companies that will be the focus of competitive intelligence are the ones that represent the potential threat of market share loss. From these firms the market share is taken. Others can be monitored also, but on occasion to monitor whether the previous analysis and decision were correct. However, the number of competitors monitored, tracked and analysed should be limited to five or six. (Ibid)

Information requirements are the next step to determine. Composing a shadow

marketing plan of the key competitor can ease up the process. This may help in establishing what you know and do not know about the competitors. This is how you should be able to come up with questions in need of answers, and hypothesis that should be confirmed or refuted. (Ibid)

After determining the information need, you should collect the relevant and vital data and organise and analyse it: what it reveals about the competitor in question and what implications they hold for your company. Based on this the existing strategies should be modified and new ones developed. (Ibid)

This whole process of developing a competitive edge is continual and should be repeated annually. Data from the competitors must be gathered more frequently, but the analysis should be a part of the business planning cycle. Other vital issue in the process is the support and commitment of the management in addition to staff. The main hitches that have to be overcome are uncertainty about the use of the information, scepticism about the competitive edge and the lack of time, budget and human and other resources. (Ibid)

So far the literature review has discussed different components and parts of competitive advantage and core competencies and next chapters will discuss the creation and development of competitiveness through various models.

2.3. Porter's value chain

According to Porter (1985, 33-34) value is an amount that the buyers are willing to pay for the products or services the company is offering. Value chain is a tool

to examine systemically all the activities the firm performs and how they interact, which is necessary in order to analyse the sources of competitive advantage and to increase the value to the customer. A company's value chain consists of the firm's individual activities reflecting the history, strategy, the firm's approach to implementing the strategy, and the underlying economics of the activities.

The whole value chain is a system that consists of several different chains: supplier value chain, channel value chain and buyer value chain, in addition the firm's own or unit value chain (see Figure 2). The supplier value chain has upstream value that creates and delivers the purchased inputs used in a firm's chain. Channel chain brings channel value as the products go through distribution channels. Buyer's chain is the ultimate base for differentiation as it determines buyer needs. The chain system differs a little depending on whether the company is a single-industry or diversified firm. In the latter case the firm value chain includes several business unit chains (Figure 3). A company's value chain may be similar to competitor's value chain but they differ thus representing a key source for a competitive advantage. (Ibid; 34, 36)

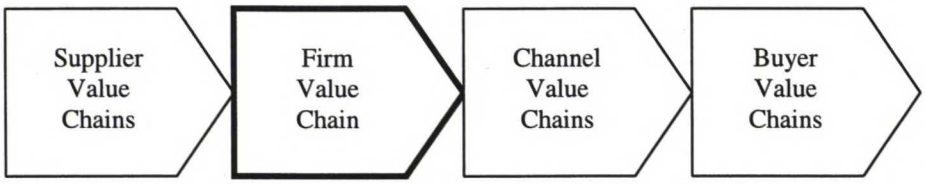

Figure 2: Single industry value chain system (Porter 1985, 35)

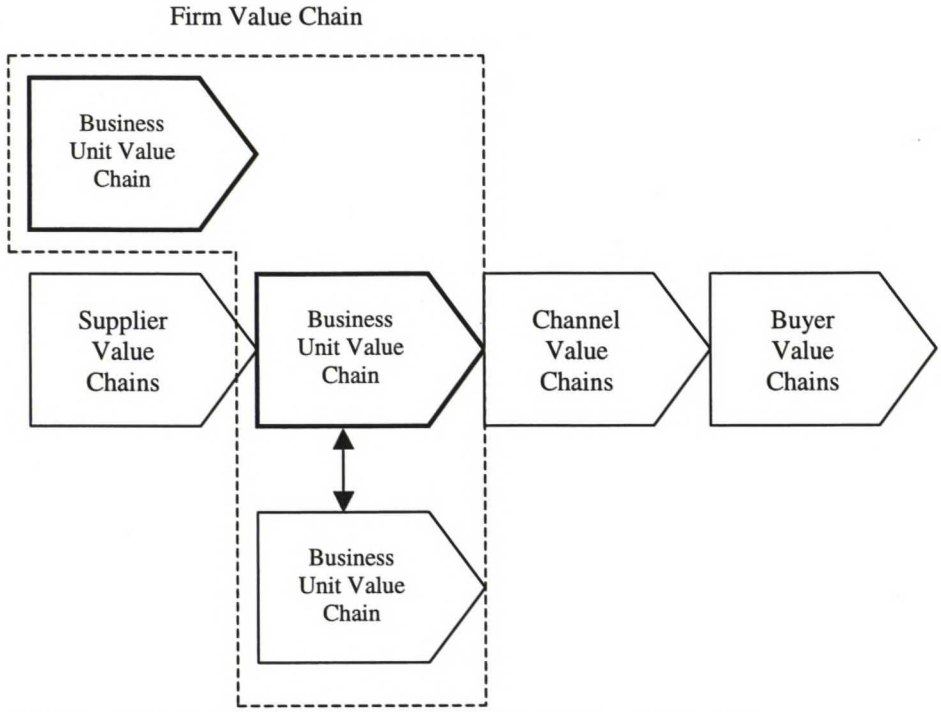

Figure 3. Value chain system of a diversified firm (Porter 1985, 35)

In value chain thinking value is the amount buyers are willing to pay for the goods. It is measured by total revenue. As the value chain indicates total value, it consists of two main parts: value activities and margin. Margin, naturally, represents the difference between the collective costs. Total value activities are formed by primary and supportive physical and technological activities. Primary activities are involved in the physical creation, sale and transfer of the product or service. Support activities, according ton their name, support the primary activities as well as each other. Therefore, value activities are separate blocks of competitive edge (Figure 4). (Ibid, 38)

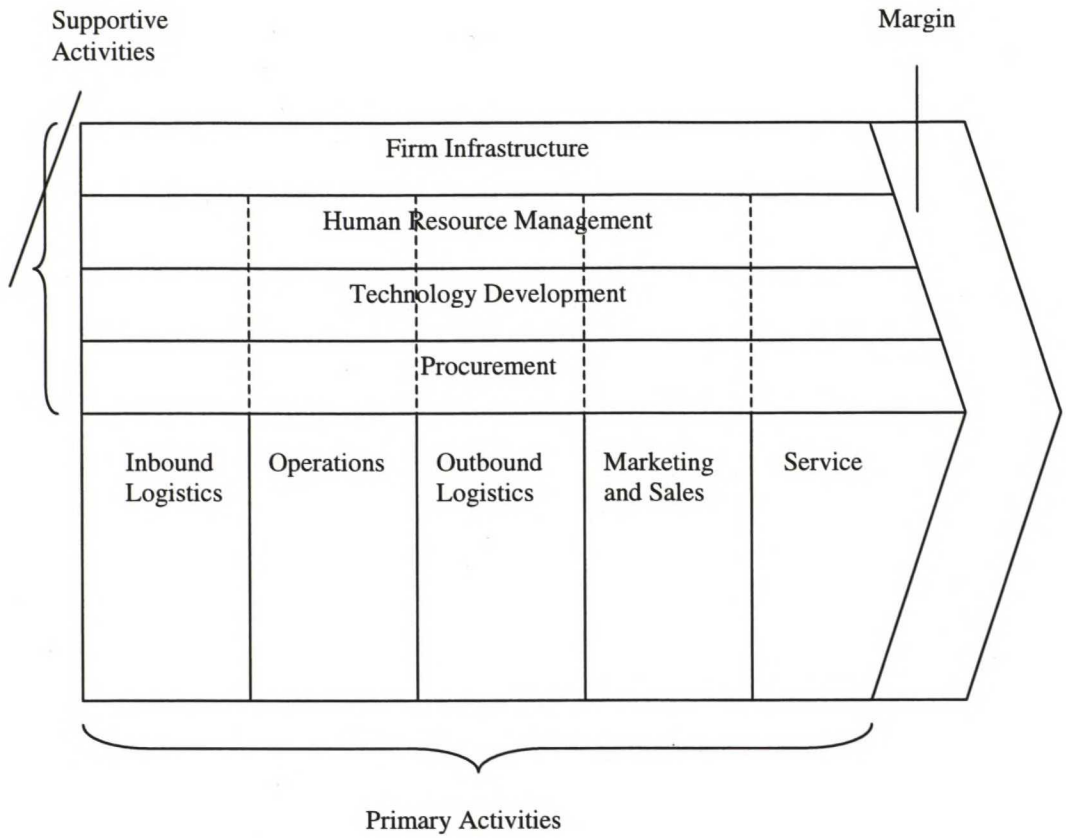

Figure 4. Value chain (Ibid, 37)

2.3.1. Primary and supportive activities

Primary activities consist of five generic categories:

1. Inbound logistics
2. Operations
3. Outbound logistics
4. Marketing and sales
5. Service.

Inbound logistics include activities connected with receiving, storing and disseminating inputs to the products, for example material handling and warehousing. *Operation* means transforming inputs into the final product, for instance manufacturing, packaging, testing, and equipment maintenance. *Outbound logistics* are activities associated with distributing the product to buyers and order processing and scheduling. *Marketing and sales* are naturally related to promotion, quoting, channel selection and relations, pricing and other activities that provide means by which the customer can purchase the good. *Services* contain, for example, installation, repairing, training as well as product adjustment or other service to enhance the value of the product. (Ibid, 39-40)

The supportive activities in the value chain can also be categorised; into four groups:

1. Procurement or purchasing
2. Technology development
3. Human resource management
4. Firm infrastructure.

Procurement cites to the function of purchasing inputs used in the company and in the value chain. Those inputs include all raw materials, supplies and other items, such as machinery, office supplies and equipment. Purchasing activities are usually firm wide and purchasing department serves many activities and policies through the company. The purchasing costs usually represent relatively small portion of total costs but often has a large impact on the company's cost and differentiation. Therefore, improved procurement practises can greatly affect the cost and quality of purchased inputs, interacting with suppliers and other functions

related to receiving and using the inputs. *Technology development* includes wide range of activities that may be grouped into efforts to improve the product and effort to improve the process. Technology is included in every value activity and occurs in various parts of the firm. Technology development takes many forms from basic research and product design to servicing. *Human resource management* (later HRM) includes functions from recruiting, training and compensation of all personnel. HRM affects both individual primary and supporting activities and the whole value chain. The cumulative costs of HRM are seldom understood well nor are the tradeoffs in different HRM costs, such as salaries compared to the recruiting and training costs. *Firm infrastructure* includes number of activities from general management, finance and planning to legal affairs and quality management. Infrastructure usually supports the entire value chain, not individual functions. Against common beliefs firm infrastructure can be a strong competitive advantage: for example negotiations and maintaining ongoing relations with regulatory organs or other parties can be the most important competitive edge. Top management can also play a vital role when dealing with the buyer. (Ibid, 40-43)

According to Porter every company has also three activity types present, and playing a different role, in their primary and supportive functions: direct, indirect and quality assurance. *Direct* type represents activities that are directly involved in creating value for the buyer. Indirect type enables to perform the direct activities continuously and *quality assurance* ensure the quality of other activities and may include, for instance, monitoring, inspecting, testing and reworking. (Ibid, 44)

2.3.2. Defining value chain

To determine competitive advantage it is essential to define the value chain for the particular industry. The process should be started from the generic value chain in which the individual company specific activities are then identified. Activities with discreet technology should be isolated and broad functions should be divided into sub-activities. Everything the company does has to be captured in a primary or support activity. However, though the activities are elements of competitive advantage, the value chain is not a collection of independent activities and competitive edges but a system of interdependent activities. These activities are connected with linkages within the chain and the linkages can lead to competitive advantage either through optimisation or coordination. (Ibid; 45, 48)

In Porter's Value chain model it is crucial to understand especially how procurement affects the whole range of primary operations; it is not just separate function but an important part of every function. Also the role of marketing and sales, and particularly marketing, is usually in this industry overlooked. It is often disregarded that marketing also affects most secondary activities, such as technology development and purchasing.

2.3.3. Cost efficiency in core competencies

Gerry Johnson and Kevan Scholes (1997, 151-155) suggest that after having analysed core competencies via Porter's Value chain model, the companies cost efficiency may also relate to their core competencies. They identified four groups of possible sources of cost efficiency:

- Economies of scale
- Supply costs
- Product or process design, and
- Experience.

Economies of scale is an important source of cost advantage especially in manufacturing organisations, but in other industries, similar economies can be found either in distribution or marketing costs, and may include sustaining global networks of partners or distributors, for example. (Ibid, 152)

Supply costs are especially important for organisations, which act as intermediaries where the value added through their own activities is low. In these companies it is also the identification and management of input costs that is critically important. (Ibid, 152-153)

In process design the assessment of efficiency has usually been undertaken through the monitoring of capacity fill, labour productivity, yield or working capital utilisation. But it is also very important to analyse which of these are the cost drivers of the process in that underpin the core competencies of the firm. (Ibid, 153)

Experience can be a source of cost advantage. Especially the experience curve between the cumulative experience and unit costs suggests that learning to do some certain activity more efficiently over time develops core advantage. (Ibid; 153,155)

2.3.4. Critique

Toby Harfield is suggesting in his paper (1998) that Porter might not be such a forerunner in strategic management and competitiveness theories after all. He claims that Porter's research and theories would not be as respected as they are now if it wasn't for his academic career and status in Harvard Business School. Harfield does, however, mainly focus in his criticism on Porter's views on strategy as a term.

Harfield states that the fact that Porter's activity (Porter has worked as a consultant to governments, business groups and individual firms) as well as the popularity of his strategy books indicates that he is a keen supporter of "'strategic management' in its mythical form." By mythical form of strategic management Harfield means that already in 1996 Kaye, according to Harfield, suggested that myths, fables and archetypes would useful for understanding organisations. Harfield states, hence, that myths then become a foundation of our 'knowing'. However, myths in business need to meet various criteria in order to be acceptable and effective. Harfield also interviewed Porter and still holds his ground on the thought that Porter is hardly a rational positivist. (Harfield, 1998)

2.4. Resource-based view

Penrose (1959; Wernerfelt 1984) originally developed the resource-based view (later RBV) and it was later reintroduced by Barney (1994, 1-16). However, according to Priem (2001) many researchers have investigated RBV during the years, for instance Wernerfelt (1984, 1995) and Rumelt (1984). RBV is about

evaluating the strengths and weaknesses of the company in question. The model makes two assertions: first is that resources and capabilities may be heterogeneously distributed across competitors and second is that these differences can be stable over time. Generally the company's resources include all financial, physical, human and organizational assets. The use of resource-based view has been facilitated by VRIO framework, which consists of four questions: 1) the question of Value, 2) the questions of Rareness, 3) the question of Imitation, and 4) the question of Organisation. Table 1 illustrates the VRIO framework.

Valuable?	Rare?	Costly to Imitate?	Efficiently organised?	Competitive Implications
No	-	-	No	Competitive disadvantage
Yes	No	-	▲	Competitive parity
Yes	Yes	No	▼	Temporary competitive advantage
Yes	Yes	Yes	Yes	Sustained competitive advantage

Table 1. VRIO framework (Barney 1994, 4)

The question of value: *do the firm's resources enable to exploit environmental opportunities and neutralize threats?* These actions help the firm to lower the net costs and raise the net revenues and, therefore, a competitive advantage can be

linked to economic performance. This question links the analysis of environmental factors with the analysis of its resources. (Ibid, 5-6)

The question of rareness: *how many competing firms possess the valuable resources already?* In order to be a source of competitive advantage the resources and capabilities must be rare among competing firms. However, other, common, resources are non less important still, they might be very essential to the firm. (Ibid, 6-7)

The question of imitation: *do companies without a resource face a cost disadvantage in acquiring the resource in question compared to those companies that already have it?* There are two types of imitation: duplication and substitution. Duplication takes place when an imitating company is setting up the same kind of resources as the firm it is imitating. Substitutive imitating occurs when the firms are able to substitute some resources with others; these resources have similar strategic implication and are no more costly to develop and will, therefore, lead to competitive parity. (Ibid, 8-9)

The question of organisation: *is a company well enough organised in order to support and use its valuable, rare and costly to imitate resources and capabilities?* Vital components of organisation in this context are the company structure, its control systems and management style, to mention few. The quality of the organisation can make a difference in gaining a competitive advantage. (Ibid, 14-15)

The VRIO framework can be applied in various strategic contexts and to wide range of resources. Barney focuses especially on managers as resources and

capabilities as well as managerial human resources, for example on formal managerial training and experience, and managerial organisational resources. He concludes that firms should re-introduce managers back to strategic management because human resources as they are, are not likely to be a source of competitive advantage but that the competitive advantage might be either a collection of managers or individual managers operating in a very special context. So the emphasis is on great teams rather than on great individuals and on the importance of continuance of integrating ideas from strategy, economics and more behavioural sciences to comprehend the competitive advantages. (Ibid, 1994: 16-33)

In his article Barney (1994, 49-62) suggests that companies should analyse their functions and resources through SWOT framework but instead of settling for studying external and environmental factors they should focus more internal phenomena – external side is only have a story.

Barney (1994) uses his VRIO framework to fill in the gaps revealed by the SWOT analysis. He, however, reminds that only evaluating external opportunities and threats and then establishing business only in high-opportunity, low-threat environments cannot create sustainable competitive advantage. Creating a competitive advantage depends on unique resources and capabilities that a company brings to competition. To achieve this, managers have to find resources that are valuable, rare and costly to imitate inside their companies and then exploit those through the organisation. (Ibid, 49-62)

2.4.1. Further analysis and critique

Wernerfelt (1984) gives a very extensive description of what *resources* actually are. He states that a resource is anything that could be a thought of a strength or weakness of a given firm. In a more formal way resource could be defined as those, both tangible and intangible, assets which are semi permanently tied to the firm (Wernerfelt 1984: Caves 1980). It is possible to identify classes of resources for which resource position barriers can be built up and these barriers are often self-reproducing. Wernerfelt also provides a resource-product matrix, which can be used to illustrate several different pattern of resource development.

Priem, however, suggests that RBV is not currently a theoretical structure. He states that the model became very popular but there has been only little critical evaluation towards it. In his article Priem clarifies RBV through two questions: 1) Is the foundational and unembellished RBV actually a theory? 2) Is the RBV likely to be useful for building understanding in strategic management? (Priem 2001) In this thesis the focus is in the latter question because it is an important factor to the empirical part of the study.

Wernerfelt (1984) and Barney (1991) did visionary work in their articles. While Wernerfelt emphasizes resources and diversification, Barney provides detailed and formalised depiction of business-level resource-based perspective. Barney's framework has supplied the footing for many RBV studies. (Priem 2001)

One problem in RBV is that virtually anything associated with the firm can be defined as a resource. This might indicate that some prescriptions for dealing certain ways with certain categories of resources might be operationally valid,

whereas other categories might be difficult for practitioners to measure and manipulate. Therefore, RBV researcher must be clearer concerning the practitioner level at which prescriptions can be made. (Ibid)

The study also shows that the RBV makes implicit assumption about product markets and that the fundamental *value* variable is external to the RBV and yet this value determination has been known to be a critical factor for entrepreneurial success. (Ibid)

2.5. International aspect on competitiveness

International aspect is an integral part of creating competitive advantages, especially in the field of the case company, since there are limited amount of customers in the home market. International operations include, naturally, all the same elements as domestic business but in lager scale: there are more both risks and chances.

2.5.1. Competitive advantage in global industries

Passemard and Kleiner have in their article (2000) studied global industries and their competitiveness based on Porter's five forces –model.

According to Porter (1985) there are five components of industry structure that represent the five forces of competition. The first one is *industry and competitors*, which stands for the intensity of rivalry. Rivalry determinants include, for

example, entry and exit barriers, brand identity, switching costs, industry growth and diversity of competitors. There are four elements affecting the industry and competitors: buyers, substitutes, suppliers and potential entrants, which are represented in Figure 5. (Ibid, 6)

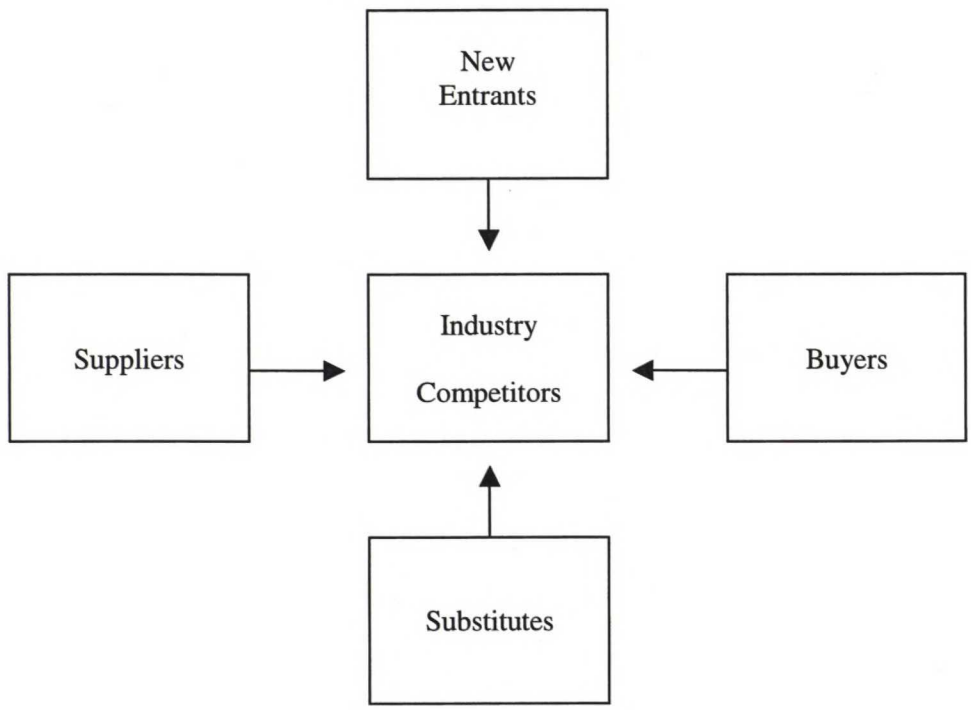

Figure 5: Elements of industry structure, five forces (Ibid, 6)

Buyers affect the rivalry through their bargaining power. The determinants of buyer power can be divided into two sub-categories: bargaining leverage and price sensitivity. Bargaining leverage contains such factors as buyer switching costs, substitute products, buyer volume and buyer concentration versus firm concentration. Price sensitivity holds within price per total purchases, product

differences, brand identity and buyer profits. (Ibid)

The determinants of *substitution* threat are a relative performance of substitutes, switching costs and buyer propensity to substitute. (Ibid)

Suppliers have a hold on an industry through their bargaining power too. The determinants of that are: differentiation of inputs, switching costs of suppliers and firms in the industry, presence of substitute inputs, supplier concentration, importance of volume to supplier, costs relative to total purchases in the industry, impact of inputs on cost or differentiation and the threat of forward integration relative to threat of backward integration by firms in the industry. (Ibid)

Potential new entrants form the threat of new entrants. This is affected by entry barriers that hinder the entry to the industry. These barriers include, for example, economies of scale, proprietary product differences, brand identity, switching costs, capital requirements, access to distribution, absolute cost advantages, government policy and expected retaliation. (Ibid)

From these five forces one can see that switching costs, for instance are a determinant in almost every element. Therefore, that could be a potential competitive edge, if a company could affect the switching cost in their industry. (Ibid, 6)

When making strategic choices the company should always remember to think of their long-term consequences on industry structure: the gains are usually seen, but they often cannot anticipate the competitive reactions (Ibid, 6).

Passemard and Kleiner (2000) state that an industry may be, strategically, distinguished from another by the fact it produces products with similar sources of competitive edge. A company must, therefore, define and elaborate a profitable approach of its industry: to be successful a strategy has to be firm and industry specific. On every competitive strategy there are two components: the structure of industry in which evolves the firm and the positioning of the company within the industry.

Passemard and Kleiner suggest that the structural analysis of a company should be done using Porter's five forces model: the action of the five forces determines the long-term profitability of the industry. However, the firm still has to take an appropriate position within the industry. The most important component of the positioning is the competitive advantage. Another criterion is the competitive scope: the extent of the target in the industry.

According to Passemard and Kleiner the evolution of competitive advantage is a function of the way the company organises and manages its activities. It is born as soon as a firm discovers a new or more efficient way than the competitors' to come to the industry and put the discovery into concrete form.

Therefore, summarised, in order to create a competitive advantage the company should process, innovate and discover the best competitive opportunities and exploit them. The preservation of the attained competitive advantage requires continuous improvement and evolution. (Ibid)

Porter's Diamond model (1990) was originally used to define and analyse competitive advantage of nations but can also be adapted to analyse international

and global business as one component in addition to firm resources and capabilities and industry environment. The model consists of four elements all influencing each other. The elements are *Factor conditions*, which represent the nation's position in production factors; *Demand conditions*, which stand for the nature of home demand for the product or service of the industry; *Relating and supporting industries* meaning the presence or absence of supplier and related industries that are internationally competitive; and *Strategy, structure and rivalry*, which represent the conditions in the nation's governance concerning mainly company creation, organisation and the nature of domestic rivalry. All four parts form with connecting lines form a diamond like figure (see Figure 6). (Porter 1990: 71-72)

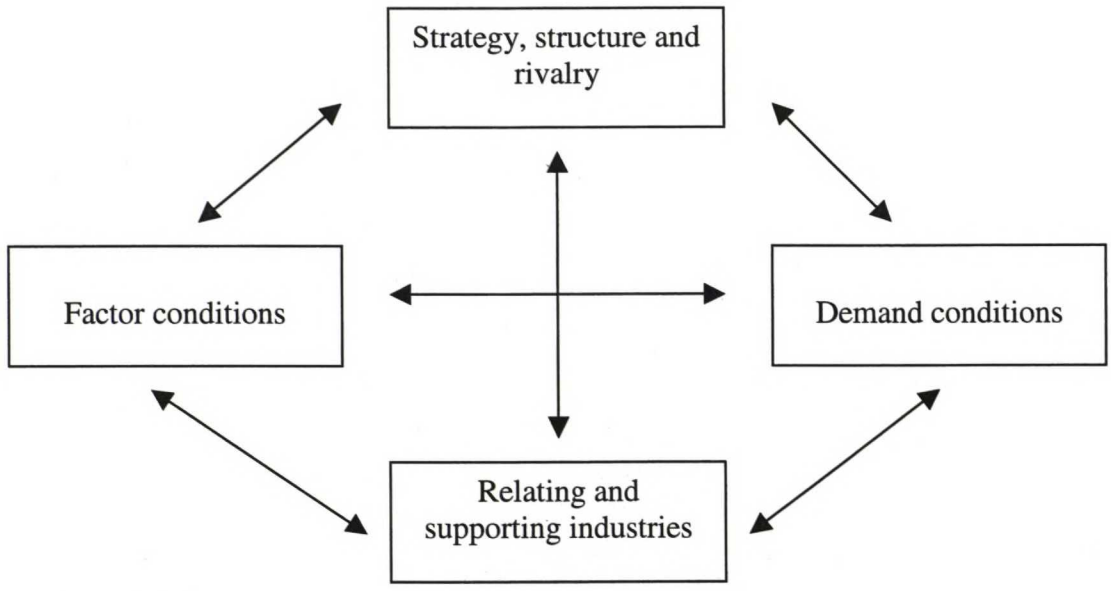

Figure 6. Diamond model (Ibid, 72)

More thoroughly, Porter states that each nation possesses factors of production, which are the inputs necessary to compete in any industry, such as labour, natural resource, capital etc. These factors can be grouped into broad categories: human resources, physical resources, knowledge resources, capital resources and infrastructure. The mix of resources naturally varies widely among industries. A nation's firms gain competitive advantage if they posses' low-cost or uniquely high-quality factors of the particular type significant to competition in the particular industry. He also presents hierarchies among the factors. There are two particularly important groups: basic factor and advanced factors. *Basic factors* include natural resources, climate, locations, unskilled and semiskilled labour and debt capital and *advanced factors* include modern digital data communication infrastructure, highly educated personnel and university research institutes. (Porter 1990, 73-77)

Three important and broad attributes of home demand can be significant in demand conditions: the composition of home demand, the size and pattern of growth of home demand, and the mechanisms by which a nation's domestic preferences are transmitted to foreign markets. The composition of home demand is at the root of national advantage while the size and pattern of growth of home demand can increase this advantage by affecting, for example, investment behaviour, timing and motivation. The home demand conditions contribute also via mechanisms by which the domestic demand internationalises and in a way pulls a nation's products and services abroad. (Ibid; 86, 97)

The third determinant of national advantage is internationally competitive related and supporting industries. Having home-based supplier industry is not important but how efficiently it is utilised, is. The most important benefit of home-based

suppliers is in the process of innovation and upgrading: suppliers help firms to perceive new methods and opportunities to apply new technology and firms gain also quick access to information, to new ideas and insights, and to supplier innovations. Related industries are those in which the companies can coordinate or share activities in the value chain when competing, or those, which involve products that are complementary. The most important are the ones that share critical activities. (Ibid, 100-107)

The way in which companies are created, organised and managed as well as the nature of domestic rivalry is the fourth determinant of the diamond model. National advantage results from a good match between choices in management, goals and strategies and the sources of competitive advantage in particular industry. (Ibid, 107)

All in all, factor creation is stimulated by perceived national challenges, by a cluster of domestic rivals and by related and supporting industries, which even solely create transferable factors. Home demand influences priorities for factor-creating investments. (Ibid, 133)

Intensive rivalry makes home demand larger and a group of rivals builds a national image and recognition as an important competitor. The image of world class related and supporting industries spills over to benefit the industry also: internationally successful industries producing complimentary products pull through foreign demand for the industry's product. (Ibid, 136)

A group of domestic rivals encourages the formation of more specialised suppliers as well as related industries and also large home demand stimulates the growth

and deepening of supplier industries. (Ibid, 139)

New entrants to market spawn from factor abundance or specialised factor-creating mechanisms and also from supporting and related industries. (Ibid, 141)

This model affects industry and firm competitiveness through a thought that nations are most likely to succeed in industries where the diamond is most beneficial. This does not, however, mean that all the companies are bound to succeed. (Ibid, 72)

Firms gain competitive advantage where their home market allows and supports rapid and fast accumulation of specialised skills and when the goals of different interest groups of the company support intense commitment and sustained investment. (Ibid, 71)

2.5.2. Critique

According to Randi Skare (1993), Porter classified several factors as national activities in his Diamond model. Such activities are, for example, transportation, research and development, marketing and sales, production, financing and administration. Skare, however, states that especially in small and open economies there is often international cooperation in these functions and, therefore, since the above mentioned activities can be very important elements of competitiveness, what seems to be Porter's hypothesis of the creation and development of a competitive advantage to be a national process, can be argued. (Skare, 1993: 8-9)

Skare has also detected three other underlying assumptions or hypotheses that Porter has used in his Diamond model. The second one was the assumption that only demanding customers and fierce competition within the domestic market leads to international success. This requires, however, a large domestic market and firms in smaller nations often define a region rather than a nation as a domestic market. (Ibid, 9-10)

The third one is related to international success being dependent on strong national clusters. Skare states clusters not to be merely growing out of the determinants of national advantage but clusters might even be blocking new ideas. He claims that cluster connection creates advantages but also puts companies in a vulnerable position. (Ibid, 10-11)

His fourth indication of a hypothesis is that the main factor leading to innovation would be domestic pressure and challenge. Skare questions whether it is necessary that the innovation is purely national and why only domestic activity triggers innovation. He presents numbers, which prove that the number of foreign patents registered in small Western nations were larger than in large nations. He also states that innovation will at some point meet a saturation point where negative external effects will exceed the benefits. (Ibid, 11-129

He has reached the conclusion that those assumptions are not necessarily valid in all countries, (especially not small ands open economies such as Norway, where Skare is from, and Finland as well) and, based on those findings he concludes that the role of nation in Porter's model as a creator of competitive edge is not very grand. Skare rather emphasises the amount of stress laid on the predominance of international elements: closed economies are more dependent on national

elements, whereas in open economies international trade is an important factor since firms are exposed to international influences. (Ibid, 12-13)

Risto Penttinen has studied Porter's Diamond model's validity in Finnish paper and board machine industry and, he concluded that the model is not necessarily suitable to describe and analyse all industries and nations. He has criticized Porter's model both at general level and related to the paper and board machine industry. (Note: it is assumed here that the paper and board machine industry is at least at some level comparable to energy technology industry.) At general level Penttinen sets critique on some of the same issues that Skare did, for example the size and openness of economies as a contributing factor, the location where competitive advantage is created and also national culture, Porter's methodology and Porter's rigorousness, to name a few. As a summary of the general critique Penttinen presents a table with also Porter's answers to the critique. The table is, however, to a broad to present here. (Penttinen, 1994: 21-56)

Penttinen does, however, state that despite the heavy critique the framework itself, with some modifications, is useful in assessing international competitive advantage in industry (1994, 66). He presents several modification suggestions from various researchers such as Dunning (1991), Narula (1993), Rugman & D'Cruz (1993) as well as Cartwright (1992 & 1993) and many more. These suggestions include for example a double diamond model by Rugman and D'Cruz and multiple-linked diamond presented by Cartwright. Penttinen concludes that adding international business activity and influence of other diamonds to Porter's Diamond model seems well founded in the case of Finnish paper and board machine industry. However, the study does not find the best suitable model for the industry in question due to limited resources. (Penttinen, 1994: 57-65; 75-76)

2.6. Business models

Business models are an important part of this study, because they can be a powerful tool for management to develop the process and structure of the company in developing and building competitiveness. All models don't take competition into consideration but the model can still help in analysing internal factors. Some researchers, for example Magretta (2002), state that only strategy is meant to take competition into consideration.

Since knowledge transfer is a very integral part of companies in the middle of transformation, transition and growing process the creation of information business model could be an asset and a tool in that. Therefore there is a chapter concerning these information business models as well.

2.6.1. General information

Business models always precede the business plan. Business model is described as a profit engine of the company and it is usually distilled into a diagram on a one page containing following elements: how and where the cash is acquired from the customers, how the firm uses cash, how the products and services flow from suppliers and business to clients and shows how the firm connects with its clients. (Business modelling: Introduction to the business model)

According to Hedman and Kalling (2003), the term 'business model' is often used to describe the key components of a business. In business research the term is used more broadly. Hedman and Kalling suggest a generic business model that

includes following components: customers, competitors, activities and organisation, resources, and supply of factor and production inputs. And in order to make the model complete, they also include a seventh factor: a longitudinal process component that covers the dynamics of the business model over time and cultural limitations that managers have to face.

The model integrates a company's internal aspects, which transform factors to resources through activities. Therefore, businesses need activities, resources and inputs from the factor market in order to be able to manage industrial forces. There are causal relations between the different components of the business model and companies need to consider the whole and holistic configuration of components. Developing and managing the model over time, gradually, includes the process perspective to business models. (Ibid)

Magretta (2002), on her behalf, suggests that a good business model begins with a view into human motivations and ends in profits explaining how the enterprise works. A new business model is always a variation of the generic value chain. She also states that business modelling is "a managerial equivalent of the scientific method" starting with hypothesis, continuing with testing and finally revises it if necessary. If business models do not work it is either due to the narrative test or the number test.

Though many people use the terms 'strategy' and 'business plan' to describe the same things, they are not the same. Business model is used to describe a system: how the pieces of the business fit together. However, according to Magretta, a business plan does not take competition into consideration. Strategy is formed to consider competition. A competitive strategy is formed to explain how a company

can do better, be different, than the rivals. Both of these terms, strategy and business model, are often used vaguely and wrongly to include and cover everything possible and only end up meaning nothing. But if used properly these concepts have enormous practical value and can be powerful tools. (Ibid)

Shafer, Smith and Linder (2005) for their part also state that business models can be powerful and have a positive role for management. As a starting point they see that business is about creating value and capturing returns from that value and that a model is just a representation of reality. Therefore, they define business model as a representation of a company's core logic and strategic choices for creating and gaining value. Business model also reflects the strategic choices made before. (Ibid)

Business models include four main terms: core logic, strategic choices, value creation and capture, and value network. Core logic suggests that a properly crafted business model helps articulate the key assumptions about the cause-and-effect relationships and the consistency of strategic choices. Creating and capturing value reflects two essential and ultimate functions that all companies must perform in order to stay viable: to create substantial value by doing things differently than competitors and to make money, to capture value. However, this creation and capturing doesn't happen in a closed environment, and therefore it is important to establish a unique relationship with different partners: to create networks. (Ibid)

According to the previous definition that business model is not a strategy but it reflects it. It does, on the other hand, make analysis, testing and the validation of the strategic choices easier. For clarification: a business model is used to analyse

and communicate strategic choices. (Ibid)

However, business model does also have problems. Shafer, Smith and Linder (2005) have traced and defined four categories of problems associated with the creation and the use of business models. These problems follow directly from the key terms introduces above:

1. *Flawed assumption of underlying the core logic*

   If business model is based on flawed or untested assumption about the future the company is going to be in trouble. All cause-and-effect relationships should be well grounded and logical after setting strategic choices.

2. *Limitations in the strategic choices considered*

   A business model should address all the core logic for creating and capturing value, not just a portion of the logic. Only one subset of categories does not make a business plan: all aspects must be considered.

3. *Misunderstandings about value creation and value capture*

   Many managers tend to focus so much on value creation that they for get all about value capture. Therefore, these organisations are usually unable to capture corresponding economic returns in relation to the value they create.

4. *Flawed assumption about the value network*

   The assumption that value networks remain unchanged in the future is very common mistake.

To conclude, Shafer et al. state that business model should be ongoing and iterative and while there are no guarantees of success, business model is still a powerful tool when properly used.

2.6.2. Information business models

Evangelos Alexopoulos and Babis Theodoulis suggest in their study (2003) that in order to gain sustainable advantage a company needs to manage their intellectual capability efficiently. This is suggested to be done with information business model. Via information business model a company can leverage the data they posses to information, which can later be acted upon to facilitate knowledge creation. The model, therefore, provides a clear and complete picture of organisational information use.

Knowledge cannot be directly observed and, therefore, the direct management of knowledge is not possible. Only information about the knowledge possessed by people can be managed. (Streatfield & Wilson 1999: Alexopoulos & Theodoulis 2003) Information business model can, however, help to solve the difficulties in information and knowledge management, preceded by information audit (Alexopoulos & Theodoulis 2003).

The authors state that information business model is built on the basis of featuring organisational information context, supporting an information audit and it has to satisfy certain criteria. Therefore, the model should demonstrate three issues: *generic scope*, *completeness* and *extensibility and reusability*. Generic scope means that the model should not describe only a particular business area nor use

concepts specific only to particular information audit techniques. (Ibid)

Completeness states that the model should capture the core information entities (for example information resource stakeholders, information resource, associated technologies, organisational objectives and critical success factors), but rather their associated characteristics and interrelationships should be adequately recorded offering a framework for analysing organisational information use. Extensibility and reusability stands for the model to be easily integrated with others used by the company in order to be reused and extended according to the corporate needs. (Ibid)

The information business models, to summarise, offers a framework for analysing organisational information needs, the methods by which information is acquired and supplied, and the purpose to which it is used. Therefore, the model does not show actual data. (Ibid)

2.7. Marketing and promotion

Marketing in industry is very challenging because most familiar marketing tools are aimed at consumer business and cannot, therefore, necessarily be adapted to business as they are. Marketing, promotion, and network relationships are still very important parts of competitiveness in business-to-business environment also. Company image and a name or 'fame' of some sort is vitally important in the energy technology industry because demand cannot be created very easily, if at all, and the company must be known to receive requests of quotations or calls for bids. First, there are some general marketing and promotional policies presented

and secondly some tools and information on promotion and relationships management that fits the energy technology industry.

According to Czinkota, Ronkainen and Moffett (2002, 356-362) promotional policies include four components: 1) advertising, 2) personal selling, 3) sales promotion, and 4) public relations. These four tools are meant to create correct and suitable images among the intended audience, and the choice, which ones to choose depends on the product or service in question, available resources and availability of the promotional tools in the particular market. It should be noted that the focus of promotions is increasingly shifted from the good towards image control.

1. Advertising has three main decision-making areas: media strategy, promotional message and the organization of the promotional program.

   Media strategy is applied to the selection of different media and the development of the media schedule. Media spending varies, naturally, both by the market and by the chosen media vehicle. Also media regulations, for example limits on the amount of time available, will vary.

   The promotional message development is often referred to as creative strategy. Here the marketer must determine the customer's motivations, who is most often the consumer. The most idealistic situation in developing message strategy is to have a world brand – a brand that is similar (produced, packaged & positioned) around the world.

2. In many cases promotional efforts consist of personal selling. This is often

the case in business-to-business operations, especially in industrial goods, where advertising does not play such a big role as in consumer marketing. Also in early stages of internationalisation personal contacts are heavily relied on.

Most often personal selling takes place in local surroundings, environment and conditions, and therefore it might be beneficial to establish a solid base of dealership with local staff or in other ways use local people, if possible. The same efforts as in advertising can also be used in personal selling. For multinational company the primary goal is to enhance and standardize all personal selling efforts, especially if the product is standardised.

3. Sales promotion is here used as an umbrella term for all the promotion that is not advertising, personal selling or publicity. Sales promotion is usually directed to consumer with coupons, campaigns, demonstration activities and direct mail. Sales promotion directed at intermediaries includes such activities as trade shows, exhibits, trade discounts and cooperative advertising. The latter type of sales promotion can be adapted to business-to-business context.

Public relations are the marketing communication function that requires both internal and external communication and it is charged with executing programs to gain public understanding and acceptance. Internal communication is very important so that appropriate communal culture can be created. External campaigns can be achieved through corporate symbols. They can be used in all advertising, in the generation of the publicity and in corporate publications to

assist personal selling as well as in all documents sent to the customers, to mention a few. Public relations also include anticipating and countering criticism.

Grikscheit and Crissy (1976) state that especially in the field of personal selling communication correlates with sales success. Cash and Crissy first discovered these issues already in 1965, but this study validates the view. According to the writers, in the sales situation the salesman has two activities: sending verbal and non-verbal signs to the potential customer and analysing verbal and non-verbal feedback, both from the customer and from the situation.

In their study Grikscheit and Crissy found that effective sales persons obtain more cues per encounter than less effective sales people. The more effective ones also obtained a greater amount of non-verbal cues. Hence, it can be stated that the effectiveness of a salesman correlates with full attention on the prospect and the customer's nuances may convey more than his speech does. Significantly, the effective salesman seems to be both a strategists and tactician planning his moves and refining his plans as the circumstances dictate. (Ibid)

2.7.1. Networking

Networking is an important part of business today. Networking is a form of cooperation between companies. Network participants may develop partnership, which may even be linked together with a contract. Networks are an important resource in competitive industries.

Wilkinson, Young and Freytag (2005) based there study on the thought that businesses need mates and network, that they do not succeed or they don't even

survive solely through their individual characteristics, competitiveness and fitness relative to evolving market and environmental conditions. These were findings of a study conducted by Wilkinson & Young in 2002.

The writers state that business relationship theories consider the context within which the relation operates as part of the problem to be dealt by the firms involved. Context shapes the way the relation develops and includes the characteristics of the relationship partners such as their size and the management style. (Wilkinson et al., 2005)

They found that the characteristics of companies forming relations are not randomly matched but result from a process of mating. They found that partners in similar market positions tend to have better performing relations. Their results also indicate that companies tend to mate with those that have different but complimentary market position. As a conclusion they state that "staying competitive means identifying, attracting and getting on with partners with whom companies can achieve a good match". (Ibid)

According to an encyclopaedia *value networks* are human and technical resources in business that work together for relationships and add value to a product or service. Value is created from the relationship between the company and it's different interest groups, such as its customers, intermediaries and suppliers. There are two types of value added: tangible and intangible. (Value networks)

Value networks are always a challenge for business-to-business relationships according to Ehret. He says that the notion that value can be created by cooperation has led marketing managers to search for win-win situations to

enhance profitability through collaborative value creation. He says that Anderson & Narus (1998) discovered that success of certain companies was based on the integration of value networks. Value networks are now seen as a source of competitive advantage. (Ehret 2004, 465)

As companies reduce the degree of vertical integration and begin to rely on a network of specialised companies they also tend to make contracts with suppliers who are able to cooperate in relationship context (Anderson et al. 1994: Ehret 2004). Therefore, it is vital for the supplier to understand the customer's processes. However, too narrow relationship approach may be a cause to loose market position. (Ibid, 465)

There are four basic challenges for relationships in a network context: relationship concept, strategy, customer interface and focus of internal operations, which can be seen in the Table 2, below.

	Buyer-seller relationship	Value network
Relationship concept	Relationship marketing, customer relationship management	Managing customer value
Strategy	Relationship value	Networking value, network position
Customer interface	Customer interaction	Marketing channels
Focus of internal operations	Customer focused functional integration	Customer-induced learning

Table 2. Challenges for relationship in a network context (Ehret 2004, 468)

Therefore, the company must gain an understanding of the scope and essence of

relationship management and a clear definition of concepts. In value networks there may be various, and sometimes conflicting goals and an increasing amount of roles performed by the participants. In this kind of environment different concepts, such as relationship marketing for example, and interest in these may just cause more confusion than just providing a clear management in this complex network context. (Ibid, 468)

Adapting relationship strategy to network context is the second challenge. In a multiple network context each strategy has to take into account the structure and dynamics of the networks. A goal should be to reach a good value position within the value network. (Ibid, 468)

The third challenge is to adapt the customer interface to the complexity of marketing channels. And the fourth challenge is to develop core competencies for reaching a unique selling proposition in the value network. The value networks call for the evolution of company's capabilities. The identification of core competencies become the central tack of management as the network competition forces companies to focus activities that they can perform in the most efficient way. (Ibid, 468)

Hence, companies must identify competencies they can build on and cultivate to achieve a unique selling proposition in a value network. Organisational learning is one factor of managing capabilities, and therefore knowledge management should be integrated in customer relationship management process. (Ibid, 468-469)

2.7.2. Strategies in industrial marketing

The company can attend the business-to-business field to increase the market share by offering lower price or by differentiating the offering in various ways, and use more tangible methods, for example creating specialities, systems or niches than in consumer business. The two basic strategies mentioned above, price competition and differentiation, in which the marketer primarily has to differentiate the product in a more objective, functional and tangible way but also aesthetic and psychological considerations have to be involved. (Copulsky 1976, 23)

The power of an established trade name is an example of psychological values in industrial selling. Often the salesmen from well-known companies are considered as better salesmen in the terms of appearance and ability and the products of such companies are thought to be better and of higher quality. But the psychological and aesthetic values are still less important than the tangible values in the industrial selling. (Ibid, 23)

In price competition the company offers a very standard commodity and tries to increase the market share by offering a low price. In this marketing strategy the winner is the one with the lowest total costs, which include manufacturing marketing and reasonable return on investment. In this strategy marketing in held into minimum and the emphasis is on efficiency of manufacturing, marketing and financing always looking for higher productivity and lower costs. (Ibid, 24)

The other strategy is to offer a product, which is or appears to be different to the customer. Here the products are considered as a set of values, which includes all

associated psychological and tangible values in addition to the product itself. In business-to-business sector the products can be differentiated by adding value to the more physical product. This additional value changes the product first into a specialty and eventually into a system. It might also create a niche product that appeals to a market segment, which the supplier can call his own. (Ibid, 24)

A specialty is a product that requires the seller's services and know-how for proper use, and a system is an extension of the specialty, which is created by adding services and machinery or equipment to the product. The system is often installed by the seller to meet specific customer needs. (Ibid, 24)

The degree of justification for the specialty of system is related to several factors: price is based on value offered, not on the cost of manufacturing; the product price is a small part of the user's total costs but the product and value set is critical to the continuous success of the user; and the specialty or systems is tailored to unique customer needs. In system selling the customer accepting the whole system may pay a premium over and above the cost the cost of buying the components individually. The customer may feel, though, that he has bought a complete system for which the seller or supplier is responsible and this can be a powerful sales tool. (Ibid, 25)

Niche or specialised segmentation is another way to differentiate. In this strategy the supplier finds a market segment that is too small to attract big players that concentrate on wider markets where they can take advantage of economies of scale. Therefore, the niche strategy is often suitable for smaller suppliers. (Ibid, 26)

2.8. Conclusions on literature

It can be found out that there is a lot of literature on competitive analysis, but only little on competitiveness in this particular industry. Most studies and researches are conducted from the viewpoint of either business-to-consumer or physical products, not so many on the point of view of business-to-business companies operating in industrial service business. The theories covered in this study cannot, therefore, be fully applied to mechanical contracting in energy technology industry. Parts of the theories or methods can, of course, be used to the appropriate context, but some adjustments must be made. Also marketing and promotion literature focus on consumer markets but there some useful material for business-to-business sectors also.

Overall, it can be stated that no theory covers all aspects of all businesses but usually some components and aspects of theories and models have to be modified according each case and situation, especially in business-to-business service sector where each sales event is a unique process and project.

3. METHOD OF RESEARCH

The problem studied is about building competitiveness in a sector that has not been studied and researched very much. It is a rather difficult field in a broad sense and innovativeness is probably needed within a firm in order to create a competitive edge compared to competitors and to achieve a better competitive position.

Since this study is focusing on a rather delicate, real problem it was considered best to use only one case company. This is a normative and qualitative case study. An existing theory is being adapted and applied to company specific context in order to develop its operations and in order to add some new features to the theory due to the little researched business area. The aim is to map the skills, features and elements of the company and then, by using a well-known model, analyse it in order to develop the operations.

It might also be beneficial to add some extra analysis on some parts, such as application of Barney's trustworthiness theory or extended analysis of marketing and promotion in business-to-business context or perhaps some study on innovativeness affecting this industry.

In order to gain information and data on this topic a qualitative case method is the most suitable. Data is collected via interviews with personnel in the case company. The questions were based on adapted version of Porter's Diamond model and Value chain model. Broad range of interviews within the company ensures at least some reliability and validity, but most likely the results will be beneficial only to the case company. Some information is also collected via direct observation and by studying company documents and publications. Monthly

personnel meetings, informal discussions and other information functions aimed at personnel can be mentioned as examples of direct observation.

The interviewees represent various departments, positions, ages and both genders in the case company. Overall 14 interviews were conducted. Most of the interviews were taped, and 2 interviews were conducted on the phone. The two frameworks, Diamond model and Value chain model, the bases of the interview questions, were presented to the interviewees before starting the interview. In phone interviews the questions were sent to the interviewees beforehand.

Since this a single-case study focusing on one company only, it is not here necessarily valid and reliable enough to generalise to all companies in the industry. The best possible validity has been ensured by using multiple sources of information and by a representative of the company reviewing the draft of the report to correct informational errors. And as mentioned before, the theory has been used in research design phase to ensure external validity.

According to Yin (2003) the goal of reliability is to minimise the errors in the study. Reliability of this study has been assured by following various guides of conducting a single-case study and a report.

4. EMPIRICAL PART

In this chapter there is, first, some industry specific information provided on both energy industry and energy technology industry and, second, the empirical findings of the research. The information on energy industry is served broadly because the energy technology is very closely tied to energy production and consumption. The thoroughness of the information concerning energy industry is grounded because the whole energy technology industry lies on that: the future of building new power plants relies on the need of energy and electricity in the future.

4.1. Industry specific information

Mechanical contracting fits best, as a definition, to mechanical engineering in energy technology industry. Therefore, first the background information on energy industry itself is given, since the energy production is the base for energy technology production. After that an insight to mechanical engineering and contracting is provided.

4.1.1. Energy industry

It has been estimated that installations and technology sales form approximately 10 % of the total worldwide turnover in power industry. Therefore, the markets are fairly large compared to other technology industries: the increment is about 2% a year in the long run. As a result it is expected that the world trade in power industry will increase substantially faster than energy consumption itself.

Energy technology is a multiform entity and, therefore, accurate examination of it is can be very complex. (KTM 1995, 32)

The biggest growth area of power plant markets has been Far East with its rapidly developing economies. Also OECD countries are a very important market area. Not too many new production plants are built but many of the older ones are in need of reconstruction and maintenance. Common trait in the development of power industry is that the constructional change towards new energy technologies has constantly proved to be slower than it has been estimated. There are also great opportunities to export know-how from Finland. There is a growing need for information and expert services and the need for impartial and trustworthy information will grow. (Ibid, 32-33)

According to resent research conducted by a work group set up Energiateollisuus ry (http://www.energia.fi) Finnish high quality energy technologies and power products are very good export possibilities. Technology export should be purposefully promoted as a co-operation of industry, government and organisations. The availability, quality and price of energy have strong roles in modern society. Power industry itself should be competitive and efficient in order to take care of the needs of the society as safe, environmental friendly and at as fair prices as possible. In international comparison the Finnish energy system is efficient. One indication of this is the rather low price of energy compared to other European Union countries. The doers in the power industry make their investment and other decisions based on economic profitability. The attractiveness of Finnish energy industry to the investors is vital to the future of Finnish energy procurement. Those production investments are needed to ensure the increasing need for power and to replace the existing capacity expiring and in need of repair.

The existing power plant capacity has to be usable and renewable until the end of its technical age. (Ibid; 5,14)

Final energy consumption in Finland can be divided into four main sectors: industry, space heating, transport and others. In 2003 almost half of the power was consumed by industry sector (49 %). The annual use of heating, 22 % of total in 2003, depends mostly on building stock's volume but also on outdoor temperatures. The transport sector (16 %) partly reflects cargo transport but also passenger car use. Others sector (13 %) consists of household and service electricity consumption as well as energy consumption in agriculture and construction. Finnish basic industry being highly energy consumptive, the cold climate and long distances, change the consumption structure from international average. (Ministry of Trade and Industry 2003, 12 and Energiateollisuus 2005, 6)

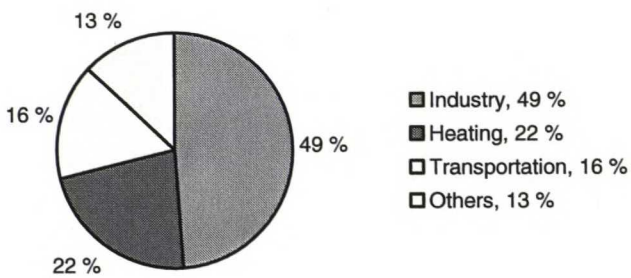

Figure 7. Final Energy consumption in Finland in 2003

In European Union 25 area in 2003 the final energy consumption distributed between Industry (41 %), Transportation (3 %), and Households and services (56 %). The statistics are due to different classification directly comparable with

Finnish numbers, but they give a reasonable picture. For example, transportation requires, as mentioned before, much more resources in Finland than internationally. (Consumption of electricity)

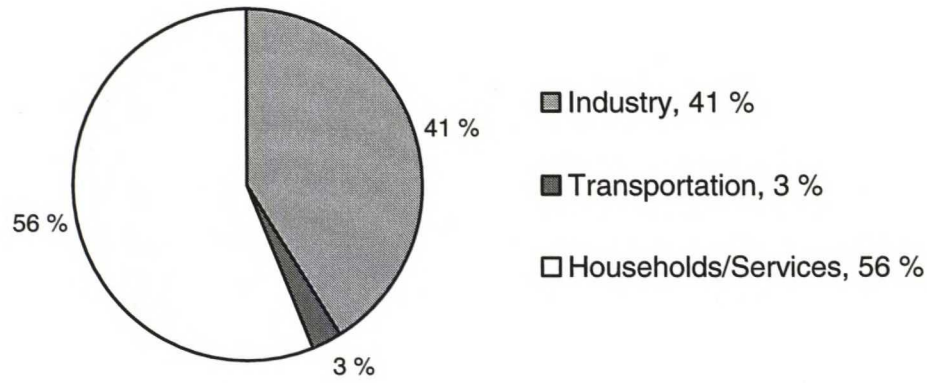

Figure 8. Energy consumption in EU-25 area in 2003

4.1.2. Mechanical contracting and construction industry

As mentioned in the beginning *mechanical contracting* means the mechanical parts of a plant, for example pipes and fittings. There are, in addition, also electricity and automation.

Construction industry can be difficult to define because it is often diverse and even vague. During the last 30 years two distinct areas have been formed: first contractors who provide management services and, second, contractors who build the physical product. This shift has been a response to the relatively high risks in the market. Large companies offering management contracting and project management services were regarded as a part of the service industry and

companies that provided resources that were used to contract the building, were described as manufacturing organisations. (Langford & Male 1990, 17-20)

At the beginning of the 1990's there could be seen the trend of holistic project implementation: new procurement methods, for example, management contracting, construction management, project management and design, imposed changes in the way how all the practises and functions were organised. From then on clients seemed to be seeking "one stop shopping" and so companies started to offer full range of expertise. (Ibid, 22-23)

It was said at the end of the 1990's that in the future the use and maintenance functions will be more and more important for technology manufacturers. This will enable the sales of spare or service parts and the implementation of modernisation and alteration. The markets will be shared with separate maintenance companies. It seems, however, that successful service business and control of expanding network requires a hard core in a company. (Hernesniemi & Viitamo 1999)

Now it can be stated that global structural change in addition to strengthening euro and depressed investment climate strained the competitiveness of Finnish technology industry companies in 2003. The turnover of mechanical engineering companies in Finland declined by 2 per cent compared to 2002 and over 2000 jobs were lost. Also material investments in Finland decreased by 13 per cent to 460 million euros. (Technology industries in Finland, 2004a; 4) Still, the results of mechanical engineering companies have shown a steady trend in recent years and remained at a satisfactory level. The results have been affected, as stated before, by the major structural changes and tough global competition. Still the financial

standing of the companies has been fairly solid. (Ibid, 17-18)

The volume of production of mechanical engineering companies was at a little lower level in January - May 2004 than it was a year before. Exporting, however, increased by 11 per cent during the same period of time. (Technology industries in Finland, 2004b)

Risks in this particular business can be divided into two categories: Technical errors and business risks. Technical errors are related to doing the work and include, for example, repairs in warranty. These mistakes are not very substantial, more rare in fact for the case company. Business risks include different mistakes in offers or biddings and flaws or errors in contracts.

4.2. Case Company

The case company with which this is conducted in cooperation is a Finnish industrial company operating in many fields, such as process industry in addition to energy technology industry. It is a subsidiary of a large Finnish construction group. The case company mainly operates as a sub-contractor in the energy technology production. The role of the company depends on the project and is defined case by case. The company's main market area is Finland and Scandinavia, but it has considerable and increasing amount of projects abroad, globally. It offers a service chain from industrial or construction design, material management and project management to subcontracting and fabrication, which full fill high juridical and financial requirements.

The turnover of the whole case company was approximately 120 million euros in the year 2005 and at the same year the number of personnel was close 1400 people. The main competitors in Finland are rather specialised, small companies, for instance West Welding with the turnover of 18 million euros and Efkava with 16 million euros turnover. The rest of the competitors are even smaller. At international level all the competitors are big companies operating mainly in Europe. German KAM with 720 million euros turnover and Austrian VAM are the most important competitors. British Shaw Dunn is also an important competitor but it operates mainly in Great Britain and Ireland. French Cie-Industries operates mostly in French speaking areas. Fabricom from Belgium with 5 700 million euros turnover is one of the most significant competitors as well.

4.3. Presentation and discussion of empirical findings

In this section the findings of the interviews and other sources of information are, first, presented and later discussed. The findings are presented in order that roughly follows the classification of Porter's Diamond model, which consists of factor conditions, demand conditions, relating and supporting industries and strategy, structure rivalry. Here the factor conditions, nation's position in production factors, are not considered very important in determining company specific competencies and are, therefore, excluded. Environmental issues do affect in the sense that Finland is a small country and there are, therefore, more forces that pull Finnish companies towards internationalisation and bigger markets.

The findings are categorised into four categories: Company specific factors, Demand conditions, Related and supportive industries and Strategy and structure.

Therefore, in comparison to the Diamond model, only factor conditions are changes into company specific factors. Especially in determining the interview questions for Company specific factors and analysing the answers, Porter's Value chain model and future Value network idea were used, which in this case is more Business Unit Value chain.

As mentioned before the group of people interviewed consist of very heterogeneous people as their demographic characteristics as well as their professional backgrounds. This ensures at least some level of validity of the research results. The interviews were conducted as a theme interviews in order to get more in-depth information on the topics than with closed questions. Answers to most questions were very similar, but naturally there was some variation, which was mainly due to different job descriptions.

4.3.1. Company specific factors

Majority of the answers to most questions in the interviews were very similar but in some others the answers varied a lot depending on the position and job description of the interviewee. According to the interviews the company offers high quality piping system, fittings and components in a holistic service chain, from industrial design to final documentation including material handling, prefabrication and installation and maintenance and in addition boiler maintenance and repairs and revisions. The clients' needs are always the starting point since the quotations are based on the clients' inquiries. All agreed that the products and services the company offers are of high quality and trustworthy. Also the skills and abilities of both employees and workers are very high and

extremely valuable. The relatively high price is considered to be composed of the general price of employment in Finland, for example taxes, social costs and employment pensions, and the rather rigid cost structure caused by the corporation.

All in all, the owner, a big corporation, was seen as both positive and negative. As mentioned above it is seen that the corporation offers a great deal of credibility, respect and good reputation partly based on the size. It is also seen as a good financial backup as well as a producer of various corporation services, such as health care and education and training for personnel and information technology, legal services as well as communication and marketing services for the case company. In negative light the corporation is seen as a strategic restrictor, since the growth strategy that would be beneficial for the company, according to the interviews, does not, as such, fit the corporate strategy.

As the needs of the case company, the interviewees saw software modernisation, both in project management and in design as well as modernisation and unification of integrated enterprise management systems, affecting financial management and salary payment, procurement and work or machine shops and plants. In boiler sector the company is not yet very widely known, which, therefore, sets its own challenge and needs: more references are needed as well as human resources.

All the interviewees were concerned about the age structure of the company and agreed that more younger personnel is needed in order to secure proper knowledge transfer and skilful people in project management, design and on site when the big age groups start retiring. And though the company has a well planned system for personnel education and other development it was felt that it

does not work and realise as well as planned. In some cases, in general atmosphere, personnel solicitude, concern and respect towards personnel were felt lacking.

Most interviewees saw that the best growth possibility would be further internationalisation, for example in the form of establishing an office or perhaps engineering workshop abroad. The rivalry in this business sector is seen rather fierce due to international competitors operating also in Finland and Scandinavia. So far the company has been, however, able to maintain the leading market position in Finland. European and other international markets would require sharpening of the strategy, clear core competencies and competitive advantage.

According to the interviews the company used to be able to compete with good reputation, image and references. Also personal relations to customers and suppliers were crucial. Nowadays these factors still exist and are, naturally, a good help but are not enough to keep up with increasing competition. Delivery reliability, trustworthiness and the best quality are few of the other thing that has helped to keep the company in the game, and still is: the investments that the investors make are very long lasting and expensive investments, even affecting national security and, therefore, they need affirmation that the project is of good quality and that it is delivered totally and in time.

These factors also bring up the prices. Some of the investors, usually slightly smaller investors who are in the need of consultation as well, are ready to pay extra for that knowledge and skills. Other, usually bigger actors do not usually need so much consultation, but solely the part they need and nothing more. Naturally, there is always a bidding contest on quotations, but more and more the

low price is the most crucial factor.

There were a few things mentioned as skills or function that the competitors do not have, at least not directly. The skills or function mentioned were the total service chain the company offers. No other competitor, not in Finland or internationally, has a similar service chain. It is not easily copied in the raw but many competitors have been able to establish networks with suppliers and subcontractors that enable them to offer similar services. The constructed chain might be a bit cheaper but it is, at the same time, more inflexible both in extra service or products needed in the project as well as the time frame of the project.

However, the wholly owned service chain sets strong requirements: it is extremely in an industry that is as competitive as this is to ensure the full employment to the whole chain. Fluctuations in the industry cause part-time over-capacity, which can sometimes lead to temporary lay-offs, especially personnel on site. Lay-offs for their part lead to insecurity and dissatisfaction among the workers.

Other beneficial skill mentioned was a part of this service chain: the design department. It is even internationally very competitive when it comes to both skilful employees and software. The design services are sometimes even bought separately when no other company can solve some particular problem. A problem related to design is the computer software: the department has very good software, but there are a lot of variations in the software in the industry. It causes extra work if the customer does not have the same system, and often they don't. At this point it is impossible to have synchronised software with every operator in the field, but some development is hoped for as some new material specifications and classification affecting design software become more common.

Project management skills were also mentioned as an asset or even as core competence. The case company was stated to be far more organised than most of its competitors. It was said, however, that modernised project management software would also be needed in order to intensify the project, which would also diminish costs in the long run. Final documentation was mentioned as a skill as well but, it was, however, stated that it might be a competence now, but can be copied very easily by the competitors.

The procurement has been a great asset but the force and strength of the department has suffered, due to resignation because of recent company and personnel rearrangements. There are not enough personnel to do the job properly and to find always the best possible solutions when it comes to price, quality and logistics. Therefore, the interviews showed that there would be a strong need to build up a functioning procurement again, and in fact it has been started: the aim is to create integrated procurement with all other industrial companies in the corporation.

According to the interviews, also skilful personnel should be hired, due to the rather old age structure of the company and to increase the resources so that more or bigger projects would not have to be turned down due to the lack of personnel resources. This concerns both office and site workers. The personnel should be hired in quite a tight schedule in order to ensure proper knowledge transfer. More marketing, PR and sales promotion is needed to make sure that all potential customers know the products, services and the high quality the company has to offer. The sales promotion also interlinks with the fact that in business-to-business sector the personal relationships are crucially important and these relations can affect greatly the sales negotiations. The relationships are of great importance

because in this type of business one person, the client has a great power and is investing a lot of money. Therefore it is more important than in consumer business where there are many people affecting the sales result.

Networking with subcontractors is vital in order to be more flexible, efficient and to save costs. The firm has been looking for some reliable subcontractors to form a solid business relationship, but so far it has made no contracts. These subcontractor networks are important weapons against the competitors so that everything the company cannot make profitably itself, it can buy from the subcontractor. At this point the trustworthiness theory of Barney and Hansen (1994) really proves it's worth.

It was stated in the interviews that no single factor, function or skill could solely enable the entry to new markets and the strategy of the owner is quite restricting in this sense. The strategy of the company and the whole corporation is reviewed later.

When discussing which activities or functions bring or produce value to the customer it was found out that material control and infrastructure are very important although they bring value only indirectly. Only the main functions, such as prefabrication, installation, offer calculations in addition to some others (storage if the products stored are owned by the customer, end user training etc.) were generally thought to bring direct value to the customer.

As a conclusion, at his point, strengths and weaknesses of the company are listed in Table 3, below.

Strengths:	Weaknesses:
o Proper technology o Quality, quality system and inspection o Engineering / Design o Entire service chain o Size and credibility o Corporation back-up financial and other o Russia & Baltic relations of the corporation o History and references o Personal relations towards clients and suppliers o Final documentation o Delivery assurance o Flexibility in project changes o Knowledge of the processes of the target (plant) o Skilled personnel, office & site workers	o Shortage personnel resources, esp. in procurement o High price level (sales) o Lack of suitable project management software o Resource management and project prioritising o Narrowness of the product/service: fluctuation o Lack of networks o Centricity of resources in Finland o Disability to really learn from customer feedback o Lack of efficient communication o Peripheral location o Inflexibility of a big corporation o Age structure of the personnel

Table 3. Strengths and weaknesses

4.3.2. Demand conditions

It could be stated that the case company has two types of customers: big investors, the equipment supplier, who are building power plants and buying subcontracting and smaller parts of the plant, and smaller clients, who are the actual plant, end customer, buying services for themselves. A third type, which was mentioned in

Introduction, was a hybrid of these two, mentioned above.

The big investors, equipment suppliers, often prefer buying smaller fragmented pieces of the whole power plant, such as only high- or low-pressure piping, design and materials separately. The logic behind this is cost saving: getting the best offer on every part via competition. This requires, however, a lot of effort from the investing company, keeping all the strings in their hands, a lot organizational work and many variables. Often these types of projects actually end up costing more in the end than buying larger entities from one supplier. This type of investors have traditionally been experts of their field not needing much consulting, or at least not willing to buy any, but in recent years some signs of fading and evanescent knowledge have started to appear: project personnel in charge of buying the services from subcontractor seem to be unaware of what is possible and what is not. A slight sift in tendency towards purchasing bigger entities and whole service chains have started to show and might be considered as a future trend possibly.

The second category of client is the *smaller ones, the end customers*. They are usually looking for more complete service chain and are therefore more preferred type of customer for the case company. They often need problem solving and, therefore, consulting services also. They need information on what would be the best way, in their case, to do some particular part, but also maintenance and usability training. This customer category is more preferable, as mentioned above, because in these cases where the case company can be part of the pre-planning and pre-design process the design department can develop the best possible solutions in their expert field and at the same time they can get correct and current material and product information to the purchasing department that

can then act on it very fast and efficiently.

Both customer groups are very influential towards their suppliers and usually they have a lot of options, so the competition is harsh. Only in rare situation they have fewer options. They all need problem solving, naturally, but their problems differ a lot from each other. In general they want good project service in reasonable price. The first category is usually very price-sensitive but values also quality and delivery reliability are important factors. The second category is also price-sensitive but is willing to pay more for consulting services. They also like the first group did as well, value high quality and reliability.

The both groups expect from the supplier or subcontractor, here the case company, high quality, delivery reliability and keeping up with the tight schedule, because delays are very expensive. They also expect to get trouble free and slick project, naturally.

Differentiation is quite a contradictory issue in this industry at the moment. In some cases differentiation does not seem to matter at all, since customers already know exactly what they need and provide very strict requests for quotations, and therefore they expect quotation based only on their request. In some cases it is possible to influence t the project plans and design already in the beginning or sometimes in the negotiation phase. In these cases it is possible to try to make additions to the contract. But naturally this requires activity from the case company. So far in export the promotion of the products and services offered is restricted only to existing clients when presenting the company, but no promotion is aimed or targeted to potential customer.

Some differentiation the case company can offer, and also promote, is the

integrated service chain: overall system, the extremely skilful design department and efficient project management. In the future possible differentiations could be after sales service in some markets and integrated procurement, but at the moment it seems that, for instance, the process of purchasing integration is severely unfinished. Also developing new products combinations could be a possibility in the future: inspection and maintenance of older pipe systems or offering something else than just energy products in related fields such as refuse incineration could be examples.

At this point when the whole industry is chancing rapidly differentiation is the only way to produce additional value to the customer and therefore the only way to survive, since with the expenses in Finland it is impossible to be the cheapest and it is not even wanted. In the differentiation process it is vitally important to have strong relationships also in order to be able to promote the products and services. But since the price is also a remarkably important to the customer the differentiation cannot be done regardless of the costs. And, as in all business, it is important to deliver all promises.

4.3.3. Related and supporting industries

There are two main categories of relating and supporting industries to energy production technology: material suppliers and subcontractors. They are very different from each other and will be analysed separately.

Firstly, material suppliers are not often influential. They are very specialised in certain type of products (pipes or fittings or other parts) or certain materials. Most

materials and products are bulk and the purchasing decision is usually based on price and delivery time. Suppliers of this type of products might give some annual discounts or products might even be sold by a fixed kilo price. In these cases the customer has more bargaining power to the supplier, since there are a lot of alternatives. Of course every order is unique combination and, therefore, differentiated because the products are bought to every project directly and not usually stored in warehouses.

Other type material supplier is more complicated to the customer. These companies, or actually just one company, are monopolistic and has bargaining power towards the client because their product material is rather rare: heat resistant material, which is used in high-pressure piping systems. There is, as mentioned practically only one supplier in Europe and other suppliers, for instance in Asia do not operate in European markets. Therefore, this supplier has a major bargaining power and can dictate the rules by which the sell and deliver; they even have some special terms of sales. This type of supplier requires strong personal relations in order to get the best possible service with the lowest possible price and shortest possible delivery time, although the good relationships are useful with other suppliers as well.

Secondly, the subcontractors are a very important industry in relation. Usually the subcontractors are either prefabricators of pipes and fittings and installation services. There is quite a lot of variation and possibilities in this sector, so the subcontractors do not have much bargaining power. Delay fines can be set to the subcontractors. Nowadays most subcontractors can be found in the newer, Eastern European Union countries such as Poland and the Czech Republic.

All the material suppliers can be tough, though, and require a good price, naturally, which requires good communication skills to deal and negotiate. Some differentiation can, still, be found: especially some Central European material suppliers can deliver rather broad deliveries and even offer some extra service such as sandblasting and storage.

The problem with material suppliers might be the difficulty of setting delay fines, so the cost of delays of the suppliers accumulates to the client company. The switching costs from changing the supplier are not very high in most cases since every order is made separately based on separate quotations. In some cases there are suppliers that are often used, if not always, and in those cases it causes switching costs. The switching costs build up from the extra use of human resources and time consumed, to name a few. If the material supplier has to be changed during a project then it becomes very expensive since it delays the whole project.

As for subcontractors there are not many switching costs since at this point there is no specific network established that would enable a direct contact and use of some particular contractor. There are, naturally, some costs from the negotiations and contract agreements. But in case the subcontractor pulls out in the middle of a project it causes a lot of costs and delay in the project schedule, but some fine can be collected from the subcontractor in most cases. New companies often contact the company's procurement themselves and introduce their products.

From the viewpoint of material handling and procurement there are a four different supplier groups: strategic products, volume products, bottleneck products and routine products. *Strategic products* are for example heat resistant products,

which are very important. There is basically only one supplier in Europe, as mentioned before, and these products are strategically very important to a project. In this category the material supplier has the power. *Volume products* are the ones which can be obtained at a remarkable discount price. The only problem is that without very efficient and integrated procurement the volume of the case company does not achieve the amount enabling the discounts. There is some competition in this category but does not seem to be real. *Bottleneck product* suppliers are very powerful, in addition to strategic products. There is, though, more competition than in strategic products. These products are usually fairly expensive and perhaps not so easily available. The last category, *routine products*, is, as the name says too, routine procurement. These products can be purchased easily and there is a lot of competition between the suppliers and, therefore, the prices are reasonable as well.

4.3.4. Strategy and structure

The growth potential in this industry cannot be considered great or substantial. Some growth may arise from normal increase of energy consumption in western society and perhaps more substantially in the third world countries. Other possibilities can be focused on energy recycling and saving systems and technologies rather than production. Growth can also be gained from other fields such as waste burning plants. In addition waste burning the new energy forms may produce markets and growth potential. The existing markets, investors, can divide their share differently due to some major projects that may arise that will cause the other investments to divide differently than before or estimated. Market share may also be increased through other ways: in the last year a major

competitor descended to bankruptcy and exits from this sector are fairly easy to other business, such as process technology. Therefore, these kinds of changes in the field may greatly affect the market position.

The corporation policy and strategy was said to have changed about a year ago when the new CEO of the corporation was nominated to start in his new position from January 2006. The hierarchy has developed to more rigid and inflexible direction: very decision has to be approved by several superiors up to the corporate CEO, which has caused the company to be very slow in decision making inn business sector which requires extremely fast decisions. It seems that this fairly recent policy as well as long on-going company arrangements have led to frustration and discontentment at the working place: personnel feels that it is left in the dark in an issue that strongly affects their everyday life and future.

It is agreed, though, that the corporation offers finance without reluctance to well-grounded investments, such as a new induction-bending machine, which was bought to the biggest workshop. The problem has pre-eminently been the small number of ideas and suggestions to new investments.

The corporation strategy is now to foster the operations in the existing markets perhaps in new but still related business areas. Russia and the Baltic countries have been and are still the main markets in addition to Finland and Scandinavia. No new markets should be considered at this point, which leaves the Russia as the main direction of growth to this company.

The fixed costs in this company are fairly light due to the project business nature. The share of fixed costs is approximately 5-7 %. In workshops the number is,

however, much higher due to expensive machinery investments. Although it might seem so, the personnel costs are manageable and more savings could be achieved through more efficient control of logistics, for instance.

As mentioned before, there is some partial over-capacity both in office personnel and site workers due to project business fluctuation, but there is also partial under capacity. This causes great difficulties in determining the right number and amount of personnel resources. In this case, the trustworthy subcontractors and perhaps even free-lancer project management, which fairly common in Central Europe, could be the answer: no fixed costs and the help would be available when needed. It could be generalised that summers, when all maintenance in plants are usually conducted, are the time of under-capacity whereas winter is often more off season causing over capacity.

The results and margins are depending on the amount of correct information already in the bidding and quoting phase: it consists of fixed costs, material costs, prefabrication and installation expenses, documentation and financial margin. All these have to be taken into consideration when quoting, and in order to gain the margin everything has to be successful. Every mistake costs time, at the minimum, and since idle time of plants is extremely expensive every project has to be finished on time. Investor set delay fines, which are very high. However, some more margins can be made with potential extra work during the project.

Especially in prefabrication and installation the subcontractor network would be essential in order to cut costs and, therefore, first get the project and second succeed financially.

5. ANALYSIS OF THE FINDINGS

In this chapter, firstly, the value chain structure typical for a company operating in this specific industry is presented and, secondly, the core competencies and advantages of the case company are presented and analysed.

5.1. Value chain thinking and cost efficiency

Value chain thinking as a whole is bringing more value to the customer and gaining more margins through that. It is essential to consider the whole chain system that includes supply value chain, channel value chain and buyer value in addition to the company's own value chain. Familiarising oneself with the structure of the value chain and its linkages the management especially could find some useful focuses or targets of development and by so also influence the difficulties of quotation calculations to which it is very important that all the latest information is available. To this especially linkages between different activities and functions and internal communication is vital. It is, therefore, extremely important to situate first the business unit value chain to the company value chain and then integrate that with the supplier, customer and other value chains or form an extensive value network. Especially in this industry where marketing can be very challenging, it is important that marketing is included especially in the value chain analysis.

Based on the nature of the industry and solely Finnish cost structure it is impossible for a Finnish company to compete with a price strategy. Some type and level of differentiation is needed. But since the customers are very price sensitive and he first elimination is usually based on pricing, the cost efficiency

should be increased so that the company could be at least at somewhat desirable price level. The study of Johnson & Scholes (1997) on cost efficiency of core competencies presented in the literature review, introduce the following as possible sources of cost effectiveness: economies of scale, supply costs, product or process design and experience. These should be well studied in order to make it to the further rounds of negotiations and ensure that the strengths and expert skills can be presented and communicated to the potential customer. Especially experience could be one possibility and supply costs too, especially in the future if the procurement department reaches a full volume and if networking succeeds.

Below there is an industry specific list of the main primary activities in value chain. From these individually, or in some combinations there can be formed a competitive advantage for a Finnish company.

Inbound logistics	Material handling
	Storage
Operations	Engineering design
	Installation
	Testing
	Prefabrication
	Project management
	Project scheduling
Outbound logistics	Distribution
	(Purchase) Order processing

Sales & marketing	Promotion
	Quotations
	Pricing
	Distribution channel choice and channel relations
Services	Maintenance
	Education

5.2. Competitive advantages and core competencies

Based on the interviews, direct observation and informal discussion it could be stated that there are few potential competitive advantages. Next some the potential advantages of the case company presented and they will be analysed based on Barney's VRIO framework, which includes four questions about value, rareness, imitation or copying and organisation.

Following activities were chosen because of their highest potential to be, or to their ability to be, developed as a competitive advantage.

5.2.1. Project management

The first potential advantage is *project management*. In the interviews it was mentioned that the case company has good project management skills: quality system and organisation of resources. Only renewed project management software could bring extra value and enhance this activity.

If project management is review with the VRIO framework of resource-based

view it can found out that it is *valuable* to a customer. Skilled personnel and well functioning systems combined form efficient project management. Hence, the project is likely to run more smoothly without unintended delays and other mistakes. This activity certainly has the potential to be valuable in the economic sense, too. However, it would require more research to clarify whether this issue is *rare* compared to competitors. Though, it was stated in the interviews that according to customers the project management skills, manners and modes and software would be exceptional.

If this is considered as a fact, the next step is the question of whether the activity is *costly to imitate*. To this question the answer is definitely yes. Construction of this kind of physical resources and intangible skills of personnel is both very costly and time consuming if built from the scratch. But if some firm base exists it is possible but still very difficult. This type of activity is even impossible to gain otherwise.

The case company has *organised* the project management in a better way than many competitors, one matter is the integrated enterprise management system that can be used to deal with all the aspect of projects. However, there are some lacks that might help to organise this skills set even more. For example, new project management software was mentioned to be lacking, which would save a lot of time and decrease the amount of work done several times. Hence, it can be stated that project management could be a competitive advantage if developed a little further and with clear objectives. Cost saving through better software could even result in quotations and through that result more business.

5.2.2. Engineering design

Another potential competitive is the *engineering design* department. The department has, according to the interviews, very skilful employees and they are contacted, for example, if some other company is having trouble and is unable to complete some calculations themselves. The department is one of a kind at least in Scandinavia

Engineering design is very *valuable* to the customer. Without this activity there will never be a plant of any kind. But different thing is whether the design will be bought from the case company since the projects have lately been very fractured and design has already been started when investors start bidding contests. The case company has also been a little hesitant to sell the design solely. But does design contribute to lowering net costs, exploit environmental opportunities or neutralise threats? No, not as it is. It is actually a rather expensive part in quotations but however, it does produce margin if included in contracts.

Design departments are *rare* among the competitors but there are many companies solely focusing on industrial design in international context. In Finland, and perhaps also in Scandinavia, the design department of the case company is one of a kind.

The design is very *costly to imitate*, if not even impossible in the sense of building it from nothing. Building up such a department requires very skilful labour, efficient computer hardware and software etc. Of course there are other possibilities: buy an engineering company or establish a network or even a partnership with one. But either way, it will be time consuming and expensive

first to find a suitable company to buy or to make partnership with it. Hence, the design can be stated as costly to imitate.

The design is rather well *organised*. There is rather effective management and structure. However, it is said that the view point of design is often not enough consulted in quotation phase and when making contracts since it often happens that they could have given various points that need to be considered in designing process affecting the contract and project in all.

All together, it seems that though design is very important and skilful part of the company, it is not at the moment a competitive advantage solely. It would require changes in the strategy as well as in the ways of action. But if the general situation changes, then the design can perhaps grow to be an operation that could even neutralize threats through excellence. It could be a strong component in competitiveness.

5.2.3. Complete service chain

The case company offers a complete service chain, a system, to its customer. It is formed from the main operations presented in the industry specific value chain and it includes everything from engineering design to material management, project management and prefabrication. The complete chain is the most favourable sales item, so to speak: it is brings out the best qualities and skills of the company: personnel and other resources.

The chain is valuable in the sense that it is, through all the components and

resources, economically productive. It does not necessarily itself lower the total costs of the company, sometimes even the contrary, but if the case company can supply a project using the complete chain, it will more beneficial to both the case company and the customer. It does cause expenses due to the project nature of the industry when all the functions may not be in full use. The complete chain can easily exploit the environmental opportunities if the market preferences shift more towards entities than fractured projects.

The system, service chain, is definitely *rare*. No competitor in Finland or internationally has a similar system.

However, many competitors abroad have been able to form cost effective and well functioning networks, which form a similar entity, representing *imitation*. Still, a network is always at least a little more expensive and always more rigid than a system in one company. And establishing networks is time consuming and difficult. Therefore, the complete service chain in the case company is more flexible in many ways and also more efficient.

In this case the company could probably be more *organised* to fully exploit and use the possibilities that the complete chain may offer. The chain is valuable, rare and costly to imitate, but still it has not reached it's full potential. Perhaps some reorganisation of resources for promotion and active participation of management could be needed to ensure that the system selling is for benefit of everybody in the company: the whole company has to blow to the same direction and work for the common good. Especially profile creation and selection of an attractive customer group and then effective promotion could be the trigger needed.

Creation of effective and trustworthy networks or even partnerships could also be a helpful steppingstone in the utilisation of the service chain. Networks and especially partnership require, as mentioned, trustworthiness in order to be successful for all parties.

5.2.4. Other possibilities

Since the company is now in the process of developing integrated purchasing functions with other industrial companies in the group it might become a competitive advantage in the future. If working properly and effectively procurement would definitely be valuable in diminishing total costs and producing margins. It would easily be capable of exploiting opportunities of the environments and probably help in avoiding some threats too. The rareness of integrated purchasing department should be studied. The integrated and effective procurement would be extremely difficult and costly to imitate. It is very challenging to find suitable and skilful personnel in this type of industry and establishing all contacts and relationships is very time consuming and expensive in many ways, for example transaction costs are high. Substitution is practically impossible and duplication would be very slow and expensive. Still the organisation is the hardest part. The control systems and management style of the department as well as the structure of the whole company are tremendously important for full utilisation. But if all this succeeds, the procurement would most likely be a very powerful tool for competitiveness.

Luostarinen (2004), as mentioned at the beginning of empirical part, presented at least eight possible areas of excellence which to use in order to create a suitable

excellence mix. A personnel was also one of these. There were some discussions in the interviews about the personnel issues, for example concerning the age structure and employee thrive of working and even respect. In this type of expert business with unique product and service mix the personnel could and even should be a competitive edge also, or at least part of the excellence mix. Therefore, it could be greatly beneficial to invest time and energy to ensure that the employees feel good at the working place, because through that commitment to the company increases.

It should be noticed, though, that these potential competitive advantages are not necessarily suitable for all companies. Most likely they would suite other Finnish or Nordic companies because of at least somewhat similar business culture and cost structure.

6. CONCLUSIONS AND RECOMMENDATIONS

This study of competitiveness of a Finnish company operating in energy technology industry was conducted as a single company case study in cooperation with a Finnish industrial company. The aim was to map core competencies and competitive advantages and through that build competitiveness. The focus was on international, European, markets but Finnish and Scandinavian, which are considered as the home markets, were included also.

The literature part included theories, model and studies of competitiveness by Porter and Barney, for example, and also literature about industrial promotion, business models.

The empirical part was executed via 14 interviews with personnel of the company from very different positions and with various job descriptions. The respondents represented both genders and various ages. The interviews included a variety of questions about the company itself, as well as about customers, suppliers and general market situation. The questions can be found the appendix.

As a conclusion it can be stated that the whole industry and even several supportive industries are at the moment under a great pressure and process to change. In addition to that the company itself and even the whole corporation is under a long changing and growing process: combining and merging different companies form new business groups. The environment and structures cause situations and challenges that make it impossible to predict the future. All these changes also offer opportunities. Now it is the highest time to develop organisational learning and development and be open for a considered change.

In previous literature there was a rather limited amount of research of similar industries, but Penttinen (1994) came to conclusion that, for instance, Porter's Diamond framework is useful with some modifications in assessing international competitiveness. Modifications are needed especially when taking industry and environment specific factors into consideration.

Penttinen states that at least international business activity factor is needed in the framework in order to suit the specifications of Finnish paper and board machine industry and also energy technology industry for the model. Therefore, in order to determine international competitive edges in such industrial fields it is vital to modify existing models and framework.

However, it has to be taken into consideration that paper and marine industries differ greatly from energy technology industry because the latter is tied to energy production, and markets and forces affecting energy production and consumption are completely different. The market acts on very different bases.

Below there is an example of a value network (Figure 9) of a Finnish energy technology company presented consisting possible network partners or related quarters. In the figure there are all the linkages shown, but in addition to those they most likely have linkages and connections to each other's. The model can be used as a framework for any company, for example, in analysing their promotional strategies and developing new business models.

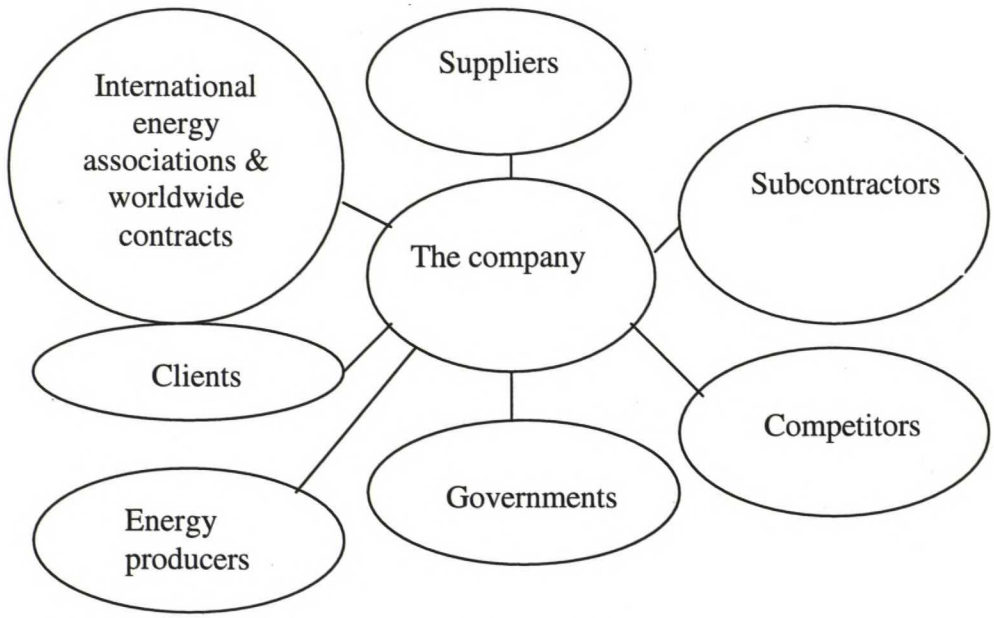

Figure 9. Value network of energy technology industry

Overall, there are multiple factors affecting the competitiveness of company, but typical for this industry is the control of the cost structure and price level, good reputation and trustworthiness, flexibility and personal contacts to both suppliers and customers.

Especially trustworthiness, as Barney and Hansen (1994) reported in their study, is vitally important for a company to be able to form a seamless relationship between the parties but also to ensure the safety of construction workers on site, site workers after the project is completed and environmental safety among many other issues. Trustworthiness might have a major effect on financials as well, since the costs of delays when something goes wrong during the construction are enormous. Finding a trustworthy partner is, therefore, also matter of reliability and cost savings.

Passemard and Kleiner (2000) analysed Porter's Five forces model and state that the model the long term- profitability of the industry. In the energy technology industry especially the forces of buyers and substitutes as well suppliers to some extent can be fierce, and therefore, competition in the sector requires processing, innovating and discovering the best possible competitive opportunities and exploit them.

There were no clear competitive edges found for the case company at the moment, partly due to the general situation of both the industry and the corporation. However, there were some potential core competencies and advantages that could, with a slight modification and concentration, be formed to a sustainable competitive advantage. Since the company lacks definite core competencies and competitive advantages it is impossible, at this point, to develop any strategy to strengthen those advantages.

In order to make the most out of the business and utilise opportunities it would be recommended for the management to first consider clarifying inside the company, which would the best possible strategy. The strategic issues have to be cleared and implementation started efficiently because organisation of this type and size is rather slow in processing change, and competitive positioning can be developed only after strategic solutions.

The core competencies and excellence mix and eventually competitive advantages should be sharpened after clarifying the main direction of the strategy. As mentioned before, the most successful companies have management as one component of the excellence mix, which in the case company has been under pressure for a change and will be even more in the future due to the age structure.

It has become clear that the complete service chain is already considered as an asset and with small actions it could even become a sustainable competitive advantage. Still it has not even been seriously communicated to potential customers. Only existing customers have been given an introduction about the products and services the case company offers. Therefore, it might be beneficial to set a clear target group for the system in question and start promotional activities. Since marketing and promotion in industrial business sector is very challenging it is considered that it might be useful to do a further research on that topic, as will be mentioned later again

6.1. Further research

This study was based on findings from one company, which cannot, therefore, be applied to other companies in the industry as it is. It would have been more valid if some other companies, competitors, could have been included in the study, which was impossible this time. There is a great need to all research concerning particularly energy and energy technology industry.

Because the area of the study is still fairly broad as it is, there are already some suggestions for further research and strategic planning to the case company. At least the following questions need to be solved: 1) How can the skills, capabilities and competencies be marketed and advertised to investors? 2) Are those skills market related or general internationally?

Generally in this field, studying the competitive elements would be interesting since this area of industry is lacking research. Because the industry and some of the related industries as well, are changing quite a lot in the near future, it would

be interesting to study the structure and working and ways of action of the industry now and after 5 or 10 years of time.

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8. APPENDIX - Interview questions

Examples of the interview questions are included in the appendix. The questions were formed based on Porter's Diamond model and Value chain model. Many of these questions are open ended and many resulted with further questions and discussion during the interviews. The interviews were conducted in Finnish but the questions are presented in English here in the appendix.

Company Specific Factors

1. What are the products and service that are offered to the customer+
2. Which are the specific and concrete needs of the company now and in the future?
3. What were the competitive weapons in the past? What about today and in the future?
4. What are the strengths and weaknesses?
5. Is there any activity / ability / other factor that is unique, or at least rare, compared to competitors?
6. Is that particular factor easy or difficult to imitate?
7. Is there any factor that would enable the company to access new markets?

Demand conditions

8. How influential are the customers?
9. What are the needs of the customer?
10. What do they expect from the supplier, the case company?

11. Can those needs and expectations be expected to change in the near future? If so, how?
12. What is the meaning and importance of products / service differentiation to the customer?
13. What is the customer's knowledge level of the product and service? How much information do the customers need?
14. What are the stimuli of the purchasing decision-making?

Related & supporting industries

15. How powerful are the suppliers? What is their bargaining power?
16. How well and to what extent do they differentiate?
17. What are switching costs of changing supplier?
18. What is the significance of volume to the supplier?

Strategy, Structure, Rivalry

19. What is the growth potential in this business?
20. What is the share of fixed costs?
21. Is their occasional over capacity?
22. How revenue is generated?